

Items of Interest

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R. Ottolengui,
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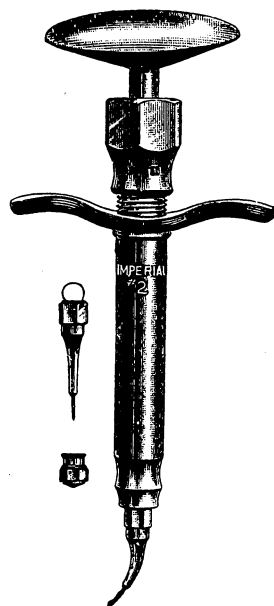


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The Removal of Impacted Lower Third Molars.*

By C. EDMUND KELLS, JR., D.D.S., New Orleans, La.

In 1903, in a paper read before the National Association, it was the writer's privilege to present to the profession a new operation for the removal of impacted lower third molars.

Ten years of further study of and experience with these cases has proven conclusively that the *basic* principles then advocated were correct, and it is with great pleasure that it has been observed that other operators have adopted this operation.

However, with continued practice and experience, it is not surprising that some changes in the details of the technique have been adopted, and they are of sufficient importance, it is believed, to warrant a description of the operation as it is performed to-day.

Impacted lower third molars may be divided into two classes: one in which a portion of the tooth is visible, and another in which it is not, and the presence of the suspected tooth is only made known by a skia-graph. Figures 1 and 2 illustrate these classes, the extracted teeth having been placed "in situ" in the models.

Technique of Original Operation.

The main features of the *original* operation in both classes was the cutting away of the *mesial cusp* of the imprisoned third molar, which was locked securely under the bell-shaped crown of the second molar, and the removal by means of burs of the process over the tooth, cocaine having been previously injected into the tissues.

The removal of this cusp would "release" the tooth, which could then

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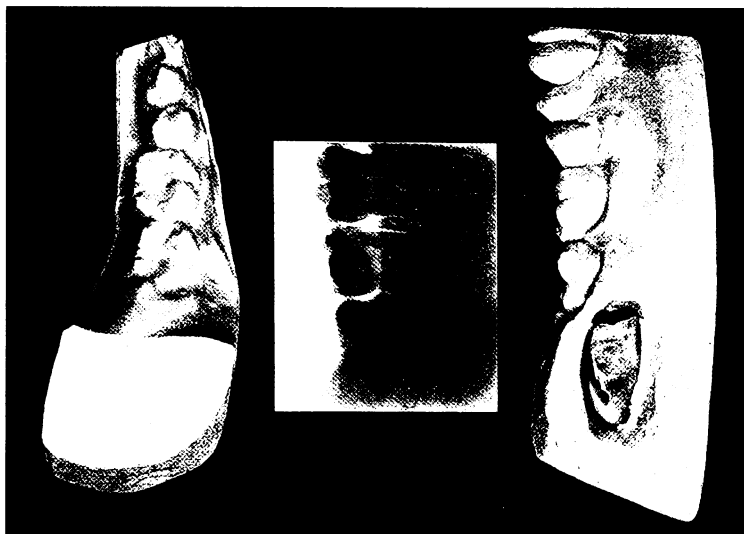


Fig. 2.

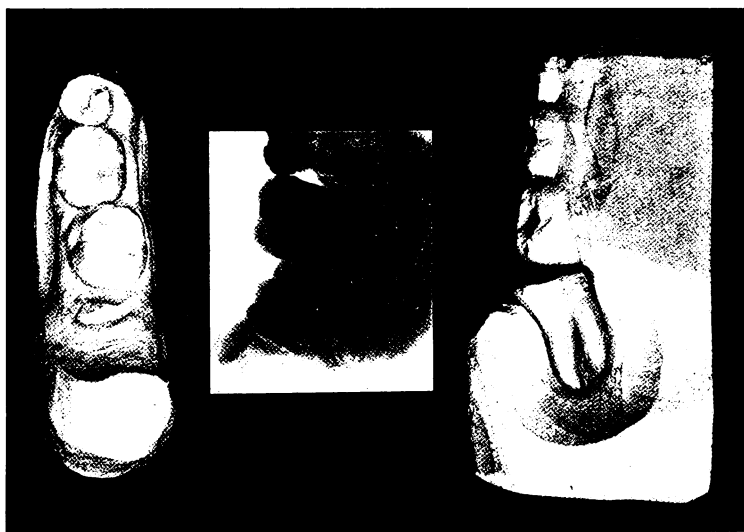


Fig. 1.

be started from its bed by an elevator, and when thoroughly loosened by that means, finally removed with forceps. At times this latter part of the operation is done under nitrous oxid.

In class one, the cutting of the cusp was started with a small diamond disk, and completed with a special bur in the right angle. Fig. 3.

In class two, a large section of the gum, and process, if necessary, over the tooth was first removed bodily. A small diamond disk could then be used only to the extent of cutting a nick in the enamel, which would allow of the steel bur getting a start, for the enamel here is certainly dense and hard, so hard that the steel instrument with which the operation was completed would scarcely make an impression. To cut to any depth in a



Fig. 3.

case of this kind with a disk would mean the horrible mutilation of the tissues.

From the nature of the case, the bur could not be held in a vertical position, and in order to reach the deeper part of the tooth the cutting had to be done from each side, which caused considerable mutilation of the soft tissues, and consequent hemorrhage.

The introduction of the contra-angle handpiece allowed this part of the operation to be somewhat changed and materially facilitated, for with this the bur can be held in a vertical position, and thus the mutilation of the tissues is practically eliminated.

In the original operation great care was taken to cut away the *cusp only*, and to steer as clear as possible of the pulp of the tooth.

One day, in a very difficult case, the writer did not exactly locate his intended cut, and imagine, if you can, his amazement when he discovered that instead of cutting away the cusp only, as intended, he had cut right through the pulp *without any discomfort to the patient*, this being done under a rather unsatisfactory local injection of cocaine.

The words "*Rather unsatisfactory*" are used, because it is well known that, as a rule, there is more or less flabby tissue in the region of the lower third molar into which the cocaine appears to be absorbed without effect.

However this may be, the results speak for themselves. In Figure 4 is seen the tooth in question, severed as it was by *mistake*.

If, therefore, such a result could be obtained by chance, it was quite natural to suppose it could be as well accomplished by intent. Therefore at the next opportunity, instead of cutting off the cusp, the crown was cut boldly in

New Technique.

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two, and with perfect success. (Fig. 5.) After nicking this tooth with a disk as described, the special bur in the contra-angle handpiece was run right straight down through the center of the tooth, working from right to left in a vertical position, and thus the crown was severed with but little injury to the soft tissues, and practically no pain—an enormous advantage over the use of the original right angle handpiece.

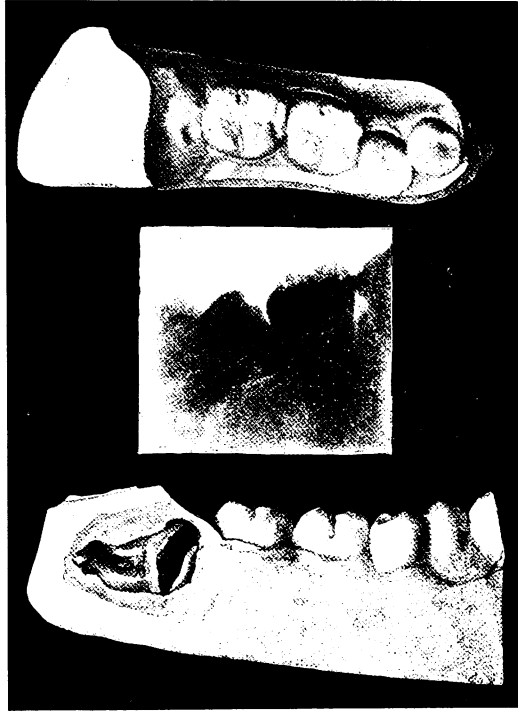


Fig. 4.

Removing such a large part of the tooth allows the remaining part to be grasped by the forceps and *drawn bodily forward*, entirely freeing it from its socket. The use of the elevator may be unnecessary, and there is no need of cutting away as much of the process over the root as heretofore practiced, but it may be necessary to cut it away from the sides, that the forceps may be placed in position.

All in all, this simple accomplishment facilitates the operation immensely; in fact, quite revolutionizes it, and the surrounding parts having been subjected to less strain and mutilation, the healing process is hastened.

**Selection of
Forceps.**

The selection of the forceps requires no little care and judgment, as undoubtedly no other tooth varies so much from a standard form as the one in question. Fortunate it is, however, that the portion of the tooth to be grasped is strong and solid, and even though the forceps do not fit perfectly, there is little danger of breaking the root. A large root like that shown in Fig. 1 could be fairly well taken hold of by the special forceps shown in Fig. 6. Those shown in Fig. 7 are of the Ash make, No. 45, but have been ground out in such a manner as to make them very satisfactory in many cases. Closing these beaks on the remaining portion of the tooth, the action is like that of a double inclined plane, tending to force



Fig. 5.

the beaks more toward the apex of the root, and thus precluding their slipping off.

Sometimes either of the forceps shown in Figs. 8 and 9 will appear to fit and grasp the tooth to the best advantage. These are also special instruments, made by the writer in his early days for the extraction of lower single-rooted teeth, or single roots of molars, at that time there being no instruments on the market of a similar design. They have smooth beaks and operate upon the elevator principle.

In each individual case the shape of the tooth must be studied, and the selection of the forceps to be used must be made with care.

**After
Treatment.**

Referring to the *healing process* the writer desires to condemn most emphatically the practice of *packing the socket* with anything whatever.

After the tooth is removed, the mouth is well rinsed, and the injured tissues are painted with aconite and iodine, and nothing further done to the socket, the hemorrhage being the very best antiseptic available.

The patient is instructed to rinse the mouth at intervals of every two or three hours with a warm solution of Pond's Extract or Tichenor's Anti-

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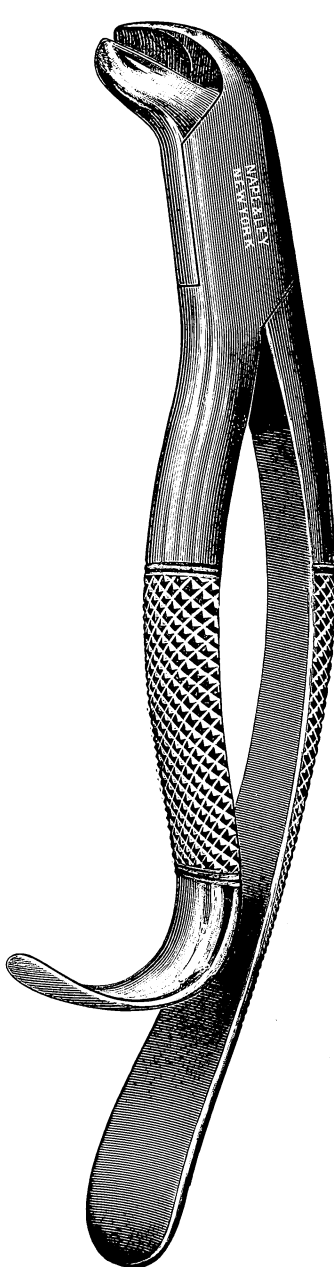


Fig. 6.

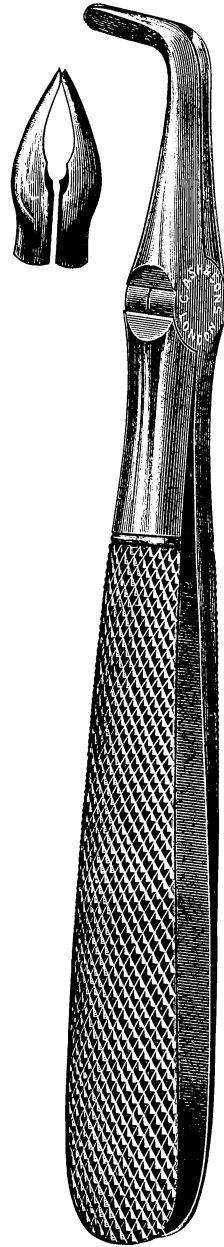


Fig. 7.

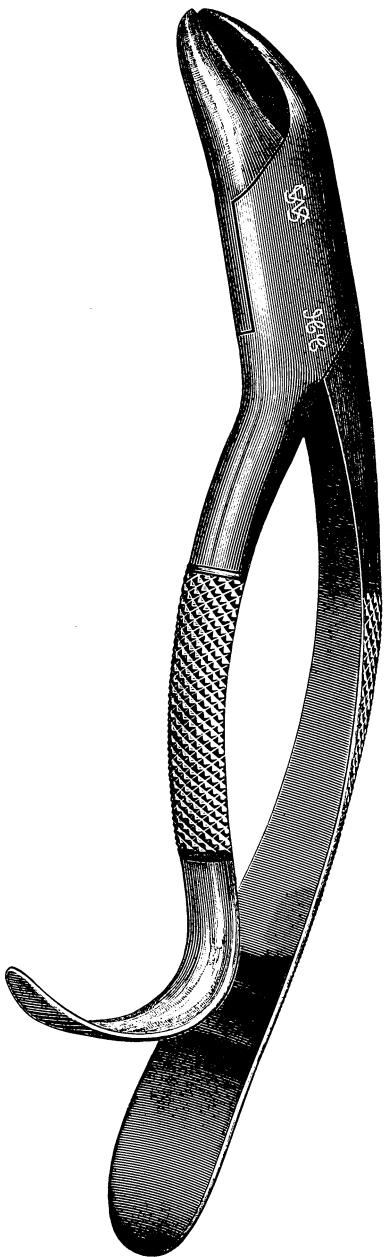


Fig. 8.

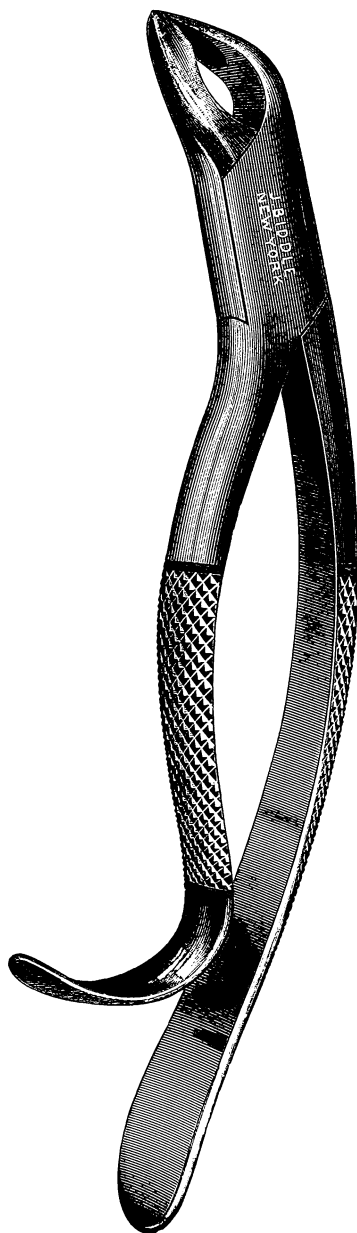


Fig. 9.

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septic (the latter being a well-known and valuable Southern household remedy), and to return the following day. At this time it is to be expected that the patient will complain of having experienced, and of still being conscious of, some soreness, but for this to be at all serious is exceptional, *if the socket has been left empty*.

The socket is now carefully washed out with a warm antiseptic solution. Having found this process rather unsatisfactory with any available syringe, the following apparatus was devised for this purpose, and found to be most satisfactory in every way:



Fig. 10.

A. Rubber tubing to allow porte polisher grasp.

An ordinary DeVilbis bottle, *which throws a fine stream*, is filled with a warm, antiseptic solution, is held by, and the valve thereon is operated by the assistant. To the tube leading from the bottle is attached a fine rubber tube, in the other end of which is inserted a silver tube. This is readily bent, as may be necessary for the case in hand, grasped by an ordinary Ivory porte polisher (which forms a convenient handle), and inserted deep into the socket, a ball at its tip preventing wounding the sensitive tissues. (Fig. 10.) When in place the assistant opens the valve and thus a fine stream is thrown into the very bottom of the socket, which must wash it out most effectually — the saliva tube being in place and carrying off the fluid to the patient's comfort.

To those accustomed to washing out a deep socket with an ordinary syringe, the point of which must necessarily move about and wound the tissues more or less, this simple appliance should commend itself.

The socket having been thoroughly cleansed in this manner, it is dried

as effectively as possible and swabbed with cotton saturated with aconite and iodine, and the patient discharged for another day, still with instructions to continue the use of the mouth wash at frequent intervals. And this treatment is continued as long as necessary, possibly a week or ten days, resulting in a rapid restoration of the parts to normal.

In times past, under a misguided judgment, a socket would *sometimes* be packed, and it *never failed* to apparently increase the suffering and prolong the healing period; therefore, that practice was soon discontinued. If one will pack a socket, and after twenty-four hours remove this packing, its extreme foulness will be most striking, and one will not wonder that it would not induce any healing action.

On the other hand, a socket treated as herein described will be found from day to day in quite a clean and healthful condition, the saliva itself acting beneficially.

**Do Impacted
Teeth Cause
Trouble?**

It might be worth while to record the conclusions reached by the writer, which are vastly different from those of some operators. The wonderfully evil results attributed to impacted teeth of all kinds by some writers of note have never been observed.

At the present time there are under observation four upper impacted cuspids which *should have* given trouble years ago, but are still unknown quantities to their owners. An impacted and unerupted upper fourth molar has been under observation for a number of years, and has given no signs of its existence other than by the skiagraph. Three bad looking lower third molars, which are apparently ample cause for dementia, according to writers referred to, do not exist in the minds of the patients. Two horrible looking impacted and unerupted upper third molars should drive the wearer crazy, but she is unaware of their existence. Not one of these patients has ever had neuralgia nor any other symptoms of trouble.

To the ordinary mind, it appears simply incomprehensible that a patient could be sent to a sanitarium and put to all the discomfort, inconvenience and expense that this naturally incurs, to say nothing of the objections to the use of a general anesthetic for such a comparatively simple operation as the removal of an impacted lower third molar, which work can undoubtedly be better accomplished with the patient in a sitting posture, and the operator surrounded by all the advantages of a well equipped dental operatory.

In conclusion would state that impacted cuspids and third molars are evidently frequently to be met with, and can be readily discovered by patients who have not erupted them being subjected to the searching gaze of the Roentgen Ray. It is not at all probable that the writer can be afflicted or inflicted with any special dispensation in this manner—he just looks for trouble, and, as a reward for his pains, finds plenty of it.

Dental Radiography.*

By HOWARD R. RAPER, D.D.S.,
*Professor of Operative Technic and Roentgenology at Indiana Dental College,
Indianapolis.*

CHAPTER VII—*Continued.*

46. To Observe the Location and Extent of a Necrotic or Carious Condition of Bone.

Fig. 266.

This radiograph is of a case of arsenical necrosis, which would not yield to the usual treatment of curettement and drug stimulation. The arrow points

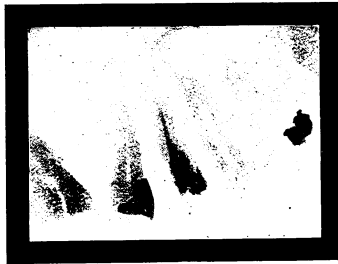


Fig. 266.

Fig. 266. The arrow points to the line of demarcation, beneath which can be seen the sequestrum.

to the line of demarcation, below which can be seen the sequestrum. The case recovered promptly upon removal of the sequestrum.

Figs. 267 and 268. Case: Necrosis of the lower jaw, caused by an abscessed tooth. The patient suffered for a year from recurrence of an abscess in the lower jaw. During this time he made several changes from one dentist or physician to another. At the time the case came under the care of Dr. Gilmer, of Chicago, the symptoms were alarming. There were two external pus sinuses along the lower border of the mandible in the bicuspid region. The patient had been unable to lie down for a period of ten days because of the intense pain which resulted from assuming a recumbent position. The body temperature rose and fell by turns. Stupor and coma occurred.

*Copyright, 1912, Howard R. Raper.

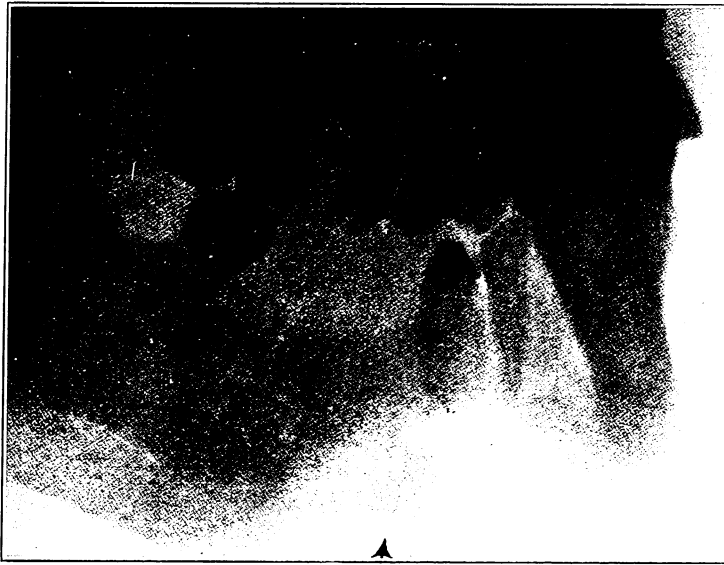


Fig. 267.



Fig. 268.

Fig. 267. The arrow points to a sequestrum about the size of the first joint of the thumb.
(Radiograph by Porter, of Chicago.)

Fig. 268. Same as Fig. 267, with the line of demarcation outlined to enable the reader to observe it better than in Fig. 267.

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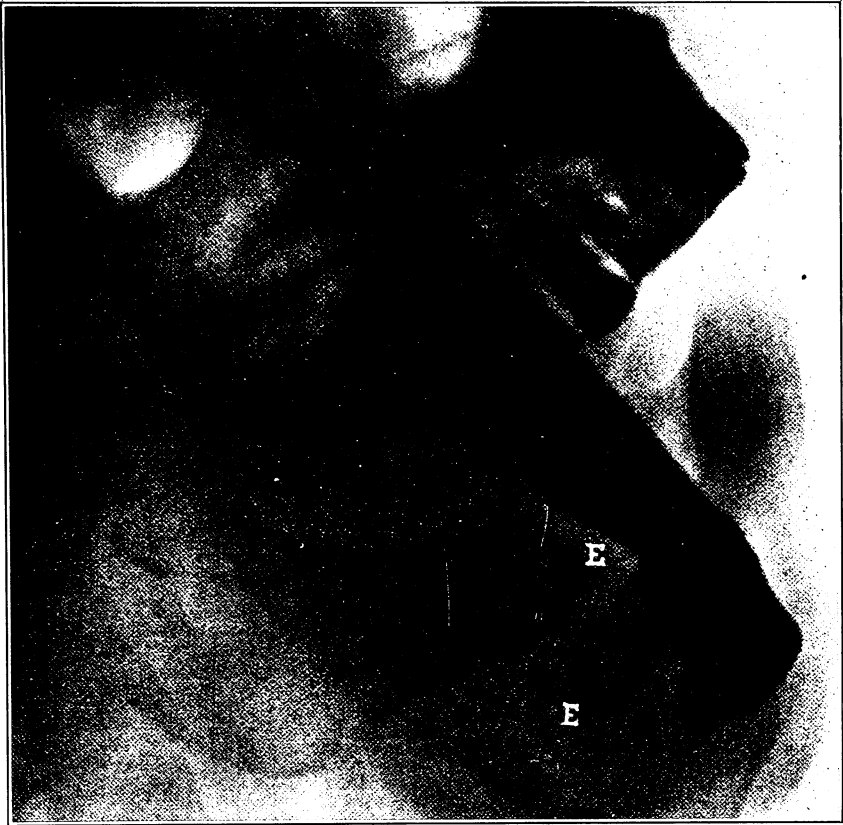


Fig. 269.

Fig. 269. EE, ends of overlapping bone.

A radiograph of the case (Fig. 267) shows a sequestrum about the size of the first joint of the thumb along the lower border of the mandible in the bicuspid and cuspid region. The line of demarcation can be seen fairly well in the plate before me. I regret that I was unable to obtain a good print of this case. The negative was an excellent one, but the photographer who made the print from it did poor work.

The operation, done by Dr. Gilmer, of Chicago, was as follows: An external incision was made along the lower border of the mandible in the region of the sequestrum, and the sequestrum removed through it. The bone was curetted, a drainage tube inserted, and the incision sewed up. The first bicuspid and cuspid were extracted.

Had the operator not had a radiograph to guide him in his work he could not possibly have performed the operation as quickly, thoroughly, and intelligently as he did, for he would not have known just where, and just how big, the sequestrum was.

Fig. 269.

A case of phosphor necrosis of the lower jaw several years after removal of the sequestrum. The jaw is in two parts, with the ends overlapping.



Fig. 270.

Fig. 270. Carious condition of the alveolar process and bone, caused by a piece of tooth root above the dummies of a bridge. (Radiograph by Lewis.)

Fig. 270.

A carious condition of the alveolar process and superior maxillary bone, caused by the retention of a piece of tooth root above the dummies of a bridge. Curettement and stimulation with drugs might, or might not, be necessary in this case, but it is probable that the carious bone will regain normal health and vitality upon removal of the direct cause of the caries—the bit of tooth root.

47. To Diagnose Antral Empyema.

Fig. 271.

This radiograph was made from a dry skull. It shows the following: The frontal sinuses AA, the orbits BB, ethmoid cells CC, the nasal cavity DD, and the maxillary sinuses EF. The sinus E is filled with lead shot, the sinus F has a molar tooth in it. The picture is printed to give one an opportunity to study the “landmarks” of such a radiograph, and so enable one to interpret the coming pictures more readily.

Fig. 272.

To observe pus in the antrum it is necessary to make a radiograph of both antra, that they may be compared. In Fig. 272 the antrum A is filled with pus, the antrum B is healthy. It must be borne in mind that the radio-

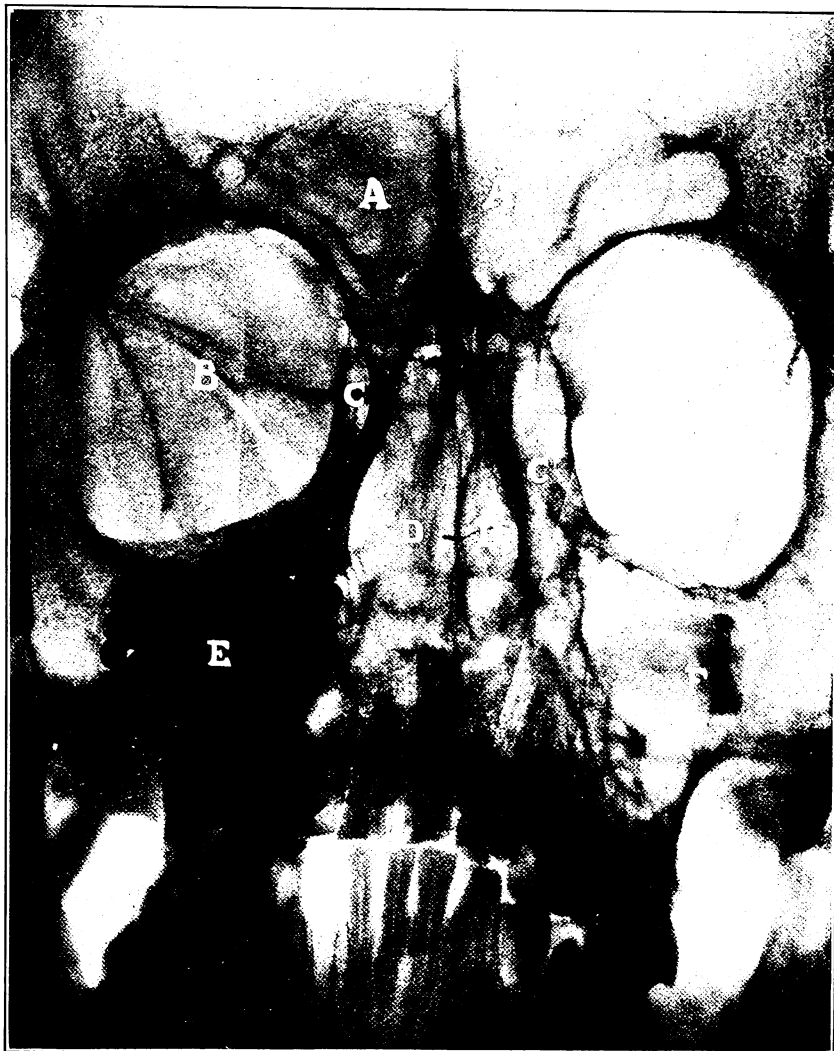


Fig. 271.

Fig. 271. Radiograph of a dry skull. One antrum is filled with lead shot, the other has a molar tooth in it. This radiograph is clearer than one made from the living subject because there was no soft parts or circulating blood to blot out detail

graph alone does not demonstrate to us the presence of *pus* in the antrum. It shows us only that there is *something* in the antrum. The appearance of the radiograph would be about the same, whether that something were

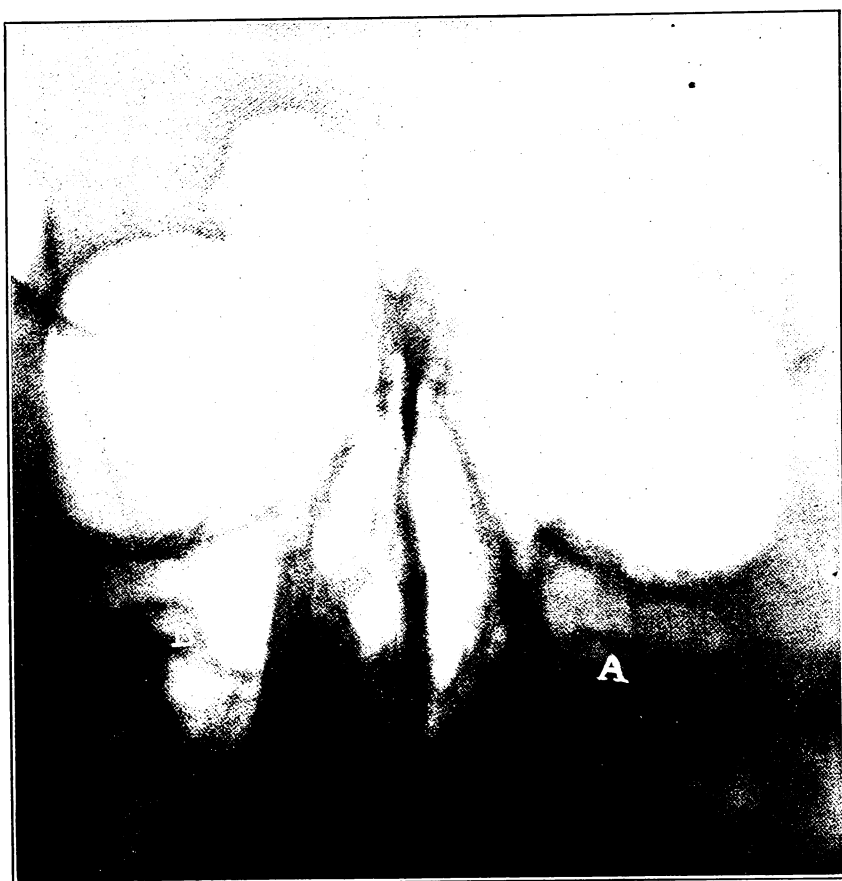


Fig. 272.

Fig. 272. A, antrum with puss in it. B, healthy antrum. (Radiograph by Carman, of St. Louis.)

pus or a soft, tumorous growth. Such a radiograph as Fig. 272, will show whether the disease is confined to the antrum or involves the ethmoidal cells and frontal sinuses. In this case the disease exists only in the antrum.

Cloudiness of the antrum A, which indicates a pathological condition. In Fig. 273 the arrows point to a dark shadow, which is an impacted upper third molar tooth. Figure 274 is a lateral view of the same case, and shows the impacted tooth clearly. Extraction of the tooth effected an immediate cure. (This case was one in the practice of Dr. Cryer.)



Fig. 273.

Fig. 273. A, diseased antrum. The shadow pointed to by the arrows is an impacted third molar. B, healthy antrum, CC, turbinate bones, EE, very small frontal sinuses. (Radiograph by Pancoast of Philadelphia.)

48. To Observe the Size, Shape and Location of the Antrum, as an Aid in Opening into It.

Unless a pus-filled antrum is opened at its lowest point, it cannot be perfectly drained. Unless it is perfectly drained the operation cannot result in a permanent cure. The size, shape and location of the antrum can

Fig. 275.



Fig. 274.

Fig. 274. Lateral view of the same case illustrated in Fig. 273. This radiograph shows the impacted tooth clearly. (Radiograph by Pancoast, of Philadelphia.)

best be observed stereoptically. Often, however, a good idea of its size, shape and location can be obtained from a radiograph, like Fig. 276, for example. Radiographs of the antrum made on films held in the mouth are very misleading and confusing, as witnessed in Fig. 275, which was made on a film held in the mouth, and is of the antrum filled with lead shot—illustrated in Fig. 271.

Fig. 276.

The dots outline a very large antrum. An opening made at the favorite site for opening into the antrum through the mouth, above their apices, be-



Fig. 275.



Fig. 276.

Fig. 275. Antrum filled with lead shot. The same as Fig. 271.
 Fig. 276. The dots outline a very large antrum. A septum is seen in this antrum dividing it into two parts. The arrows point to the lower part.



Fig. 277.

Fig. 277. The arrows point to a piece of tooth root in the antrum. (Radiograph by Carman, of St. Louis.)

tween the second bicuspid and first molar (the first molar has been extracted), would not puncture this antrum at its lowest point. The root of the second molar seems to penetrate the antrum. Whether it actually penetrates the floor of the antrum or not I cannot say definitely, because of the lack of perspective in the radiograph. I am inclined to think, however, that it does not—the lower part of the antrum and the end of the root overlap, the tooth root passing to the lingual of the antrum.



Fig. 278.

Fig. 278. Same case as Fig. 277 after removal of the piece of tooth root. (Radiograph by Carman, of St. Louis.)

Because of its unusual size the lower part of the antrum was thought to contain a malignant growth. Dr. Cryer rejected this interpretation, saying that the antrum must have been of the size shown in the radiograph before the formation of the second and third molars, and that the large antrum was responsible for the pinched-together condition of their roots. He theorized further, accounting for the pain the patient suffered

by surmising that the pinched condition of the roots of the third molar was causing pressure on the dental pulp. In his description of the case Dr. Cryer does not mention the faulty canal filling in the second molar as a possible cause for the pain. Both molar teeth were extracted and the patient was freed from neuralgia.

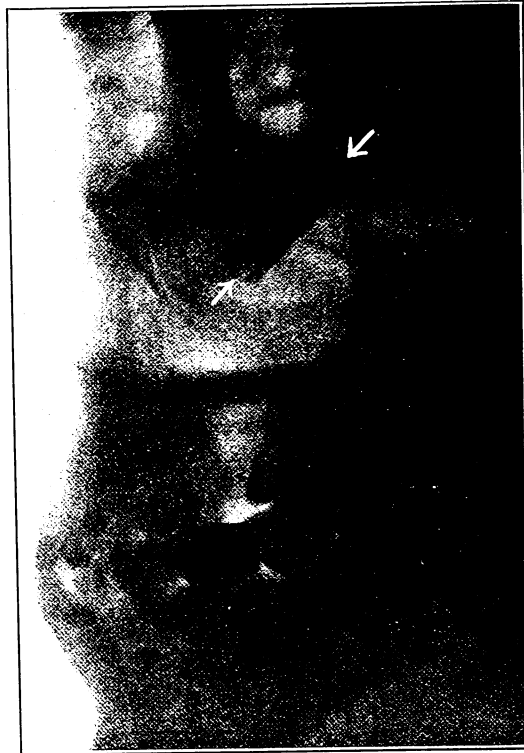


Fig. 279.

Fig. 279. The arrows point to a piece of rubber tubing in the antrum. (Radiograph by Pancoast, of Philadelphia.

49. To Locate Foreign Bodies, Such as Tooth Roots or Broaches, in the Antrum.

Fig. 277 shows a piece of tooth root in the antrum. It is a portion of the second bicuspid, which had been extracted (?) about a week previous to the time when the patient presented to Dr. Virgil Loeb for treatment. The first molar was extracted, an opening made into the antrum through one

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Fig. 280.



Fig. 281.

Fig. 280. The arrows point to a fracture of the jaw in the region of the angle. (Radiograph by Cole and Raper.)

Fig. 281. The arrows point to a fracture of the lower jaw just posterior to the second bicuspid. The opposite side of the same jaw radiographed in Fig. 281. (Radiograph by Cole and Raper.)



Fig. 282.

Fig. 282. Excellent radiograph of the temporo-mandibular articulation. Made from a living subject. (Radiograph by Tousey, of New York City.)

of its alveoli, and the piece of root removed. The object of the operation was to remove the piece of tooth root from the antrum. This was accomplished. And again let me repeat what I have said before: An operator may make a greater mistake than that of the extraction of a tooth—he may conserve the tooth at the expense of the health and happiness of the patient. Conservative dentistry often, all too often, means conservation of disease.

Dr. Cryer says of Fig. 279: "It is made from a patient who had trouble in the maxillary sinus for some time. The picture demonstrated that a piece of rubber tubing, which had been used for drainage, had slipped into the antrum and become lodged in the region of the ostium maxillare. After its removal and a brief treatment, the part became well."

Fig. 279.



Fig. 283.

Fig. 283. Dislocation of the condyle from the glenoid fossa. A, condyle. B, eminentia articularis. (Radiograph by Cole and Raper.)

50. To Observe Cases of Luxation Before and After Reduction.

The symptoms of dislocation of the condyle from the glenoid fossa are so characteristic that, it seems to me, even the most inexperienced should recognize them with ease. It is a fact, however, that the case illustrated in Figs. 280 and 281 was diagnosed dislocation, because I presume the patient could not get the anterior teeth together. The radiographs show two fractures. Fig. 280 near the angle, and Fig. 281, of the other side of the jaw, in the second bicuspid region.

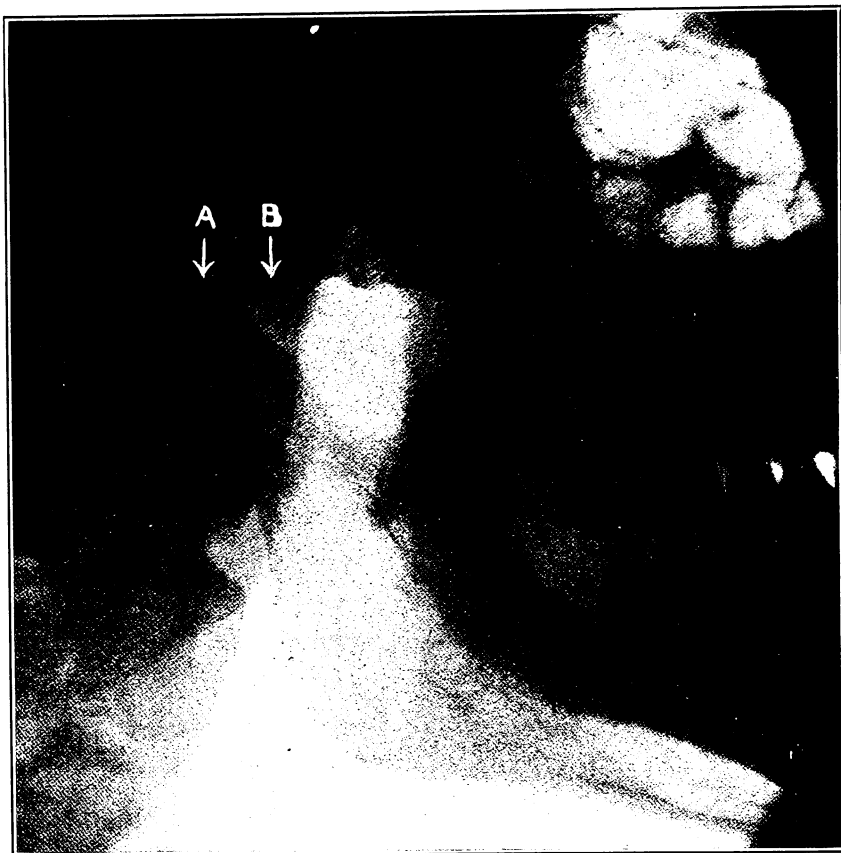


Fig. 284.

Fig. 284. Same as Fig. 283 after reduction of the dislocation. A, condyle. B, eminentia articularis. (Radiograph by Cole and Raper.)

Fig. 282.

living subject.

This radiograph is by Tousey, of New York City, and is one of the clearest radiographs of the tempero-mandibular articulation ever made from a

Figs. 283 and 284.

Case: Dislocation of the condyle from the glenoid fossa. Fig. 283 shows the condyle A anterior to the *eminentia articularis* B. Fig. 284 of the same case after reduction. While it fails to show the condyle itself clearly, it shows the neck of the condyle and demonstrates that, in the picture, the condyle A is on the other side of the *eminentia articularis* B.

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51. In Cases of Fracture of the Jaw.

Fracture of the jaw is almost always accompanied by such a great deal of swelling and induration that digital and ocular examination are highly unsatisfactory. The operator who treats a fracture should know just where and what kind of a fracture he is dealing with. If there



Fig. 285.

Fig. 285. Fracture of the mandible at the symphysis. (Radiograph by Blum, of New York City.)

be displacement of the fragments, he must know how much, and in what direction, the displacement occurs, in order that he may properly readjust the parts. This knowledge can be gained only by the use of radiographs—stereoptic radiographs in cases where there is considerable displacement of the fragments.

Fig. 285.

Fracture at the symphysis. The appliance on the teeth is being used as a splint.

Figs. 286 and 287.

Case in the practice of Dr. Cryer. Fig. 286 shows a fracture of the mandible at the angle. The body of the jaw is displaced downward. Fig. 287 is of the same case after reduction and adjustment of an interdental splint. While the apposition of the fractured ends is not perfect yet, there is a very great improvement over the condition showed in Fig. 286 and, I believe the apposition to be as near perfection as human ingenuity is capable of carrying it.

Just when to remove a splint and bandage from a fracture case is always a problem. The splint shown in Fig. 287 was removed at the end of the eighth week. Dr. Loeb, of St. Louis, Mo., states that radiographs are a great aid in determining just when to remove splints.

Fig. 288.

A double, comminuted fracture of the mandible four months after the accident. The bone in the region of the fracture is necrotic.



Fig. 286.



Fig. 287.

Fig. 286. Fracture at the angle of the mandible. Displacement of fractured ends. (Radiograph by Pancoast, of Philadelphia.)

Fig. 287. The same as Fig. 286 after reduction and adjustment of an interdental splint. (Radiograph by Pancoast, of Philadelphia.)



Fig. 288.

Fig. 288. Double comminuted fracture of the mandible. That the reader may understand the picture, observe the following: A, zygomatic arch; B, sigmoid notch; C, upper part of ramus; D, one fracture; E, the other fracture; F, fragment of bone between fractures.

52. In Cases of Ankylosis of the Temporo-Mandibular Articulation or the Joint Formed by the Tooth in the Jaw.

The radiograph is of value in cases of ankylosis to observe the cause of the ankylosis.

Fig. 289. Case: A miner who had sustained a traumatism resulting in ankylosis. The ankylosis had existed for several months at the time Fig. 289 was made. The dots outline the missing parts, *i.e.*, the anterior border of the ramus and the coronoid process. The disease of the bone could not have failed to affect the temporal and masseter muscles. It is my belief that in this case the true muscular tissue was destroyed and replaced with cicatricial tissue, which condition caused a false ankylosis. I consulted two surgeons, but neither was able to suggest a corrective operation.

An orthodontist was unable to move a tooth into proper occlusion.

He referred the case to me, thinking perhaps the presence of a supernumerary tooth body was responsible for the immobility of the tooth. A radiograph demonstrated the absence of any such body, and showed that

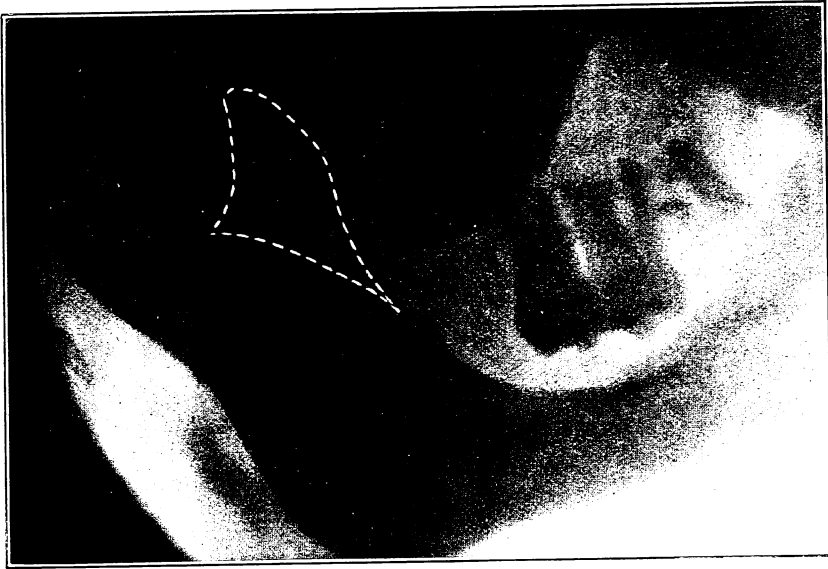


Fig. 289.

Fig. 289. The dots outline the missing parts—i.e., the anterior border of the ramus and the coronoid process. (Radiograph by Cole and Raper.)

the tooth had practically no periodontal membrane at all. There was a condition of partial ankylosis, to overcome which it was necessary for the orthodontist to reinforce his anchorage and exert more force on the refractory tooth. I do not print a radiograph of this case because of the great difficulty of showing the periodontal membrane, or the absence of it, in a half tone.



The Present Condition of the Treatment of Root Canals.

J. A. VUILLEUMIER, D.D.S., New York.

Guido Fischer has published an essay in the *Deutsche Monatsschrift fur Zahnheilkunde* dealing with the conditions confronting us in the ever important question of filling and treating a putrescent root canal. That we have not as yet reached the state where we can do the work, and feel assured of no possible future trouble arising from it, we all know.

Mayrhofer has shown in his experiments with infected roots, that our disinfecting agents only act on the parts in the canal lumen proper and immediately surrounding it. Certain streptococci, which he found predominating in infected canals, grow in chain-like form into the canaliculi of the cementum and dentinal tubuli, thereby escaping the action of the drugs. The canaliculi have such a small lumen that osmotic processes can easily be interfered with through coagulation of the albuminous fluid contained in them. The stronger the disinfectant used, the faster the clotting. A disinfectant, which does not coagulate albuminous matter, is therefore preferable.

Sterile canals were reinfected after a certain time, and this Mayrhofer attributes to the invasion of microorganism from the surrounding canaliculi; conditions being favorable, the infection ultimately reaches the apex and its surrounding tissues.

Microscopical work by Dr. J. B. Stein, of the New York College of Dentistry, and recently by Guido Fischer, have shown another difficulty with which we have been dealing, and which will explain to us failures in our work which heretofore we have been unable to account for.

Stein and Fischer found, the latter in examining hundreds of teeth, that about 90 per cent. have no single opening of the root canal. The pulp in reaching the apex ramifies in small branches collaterally. The ramifications reach the peridental membrane through minute canals. These canals are invariably impossible of access. The disinfectants used are not strong enough to destroy the infection therein. It may only produce a partially aseptic mass. Even such antiseptics as the trikresol formalin mixture do not entirely sterilize root canals, says Mayrhofer. We, however, get excellent results from their action.

Dr. Buckley, who introduced this compound, has explained the action taking place as a chemical one. Some end products of the decomposition of the pulp, such as H_2S and NH_3 , uniting with $HCHO$ in solution, form CH_3OH , S_2 and $(CH_2)_6N_4$ (Urotropin). That these reactions *do not*

occur is very likely, as I have explained in a previous article. The benefit of the HCHO lies, no doubt, primarily in its bactericidal action.

There is also a question whether these gases are formed in such large quantities as to unite with the HCHO in liquid. Their chemical affinity would first bind them to other molecules before any action between the HCHO would result. The decomposition of the albumins is so complex and the molecules formed partly so dependent on the presence of the bacterial flora, namely, aerobic and anærobic, that it is difficult to state what reactions do take place with the medicinal agents introduced. There is no doubt that acids in the nascent state are formed through oxidation, and that these acids unite with the inorganic salts of the cementum, softening the latter.

With these chemical changes taking place at the pericementum and the presence of bacteria, we have a constant hyperemia at that area and ultimately immigration of leucocytes, resulting in abscess, leading to fistulas, cysts and granulomas.

A curetted abscess cavity will hence not always heal favorably, because we have not reached the seat of infection. In such cases amputation of the root seems to be the only successful remedy in that it completely removes the seat of infection.

This would explain to us failures of some of our best work, for which we have been unable to account heretofore.

**Root Canal
Filling.**

Many root canal filling materials have been brought before us, and none has possessed the requisites of being infallible.

Among the most advantageous seems to be paraffin. Paraffin can be readily combined with various disinfecting materials. It is non-absorbent and non-irritating. Mayrhofer has advocated Balsam Peru. I have used it in many cases, but have not met with the expected results. Balsam Peru is a heavy, thick liquid, at room temperature. At body temperature, however, and that is the temperature with which we are dealing, it is of watery consistency, readily permeates the opening of the root canal at the apex, and on entering the surrounding tissues may cause acute pericementitis. It is also absorbed, as I have found a number of canals empty, though in an apparent sterile condition. There was still a slight odor of Peru Balsam to be noticed.

Pastes of various kinds are also used. Even mumification of the contents of the roots, claim the followers of Ad. Witzel, is far better than the partly clean root canal. Witzel amputates the crown part of the pulp in the pulp chamber, under as perfect aseptic conditions as possible. Then,



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treating the remainder with strong antiseptic solutions, he fills the pulp chamber cavity with a similar paste and finishes the filling, obtaining excellent results. To this day, however, we know of no mixture that positively produces such mumification.

Summing up, the conditions are as follows:

(1) As we cannot obtain perfect sterilization of root-canals, due to the anatomical conditions, we must attempt to insert a filling material which will act as a permanent disinfectant.

(2) Therefore, such volatile agents as alcohol, formalin, creosote, carbolic acid, trikresol and balsam Peru produce but temporary results.

(3) An ideal combination would be a mixture of a strong volatile agent with a permanent insoluble or partly soluble body, which may only change at a later time chemically.

(4) As such might be considered the metallic disinfectants, such as colloidal silver, colloidal gold or platinum, calomel, which would form traces of Hg Cl_2 , and metallic Hg through Ca Cl_2 after some time. In case of anerobic fermentation, $\text{Hg Cl}_2 + \text{Hg}$ might be reduced again to Hg_2Cl_2 (Calomel).

Thus we are still looking for a *permanent* disinfectant as a filling material for root-canals, and there is every hope that the time will come when some one may be able to combine such a body.





The Ideal Porcelain Crown.

By HART J. GOSLEE, B.S., D.D.S., Chicago.

For the ten or twelve anterior teeth, where porcelain is demanded for cosmetic reasons, the all-porcelain replaceable or interchangeable crown, *with cast base*, and with or without a band, as the requirements may indicate, may be successfully used in a very large percentage of cases, and closely approaches the ideal form of artificial substitute for the natural tooth.

This type of crown is undoubtedly the strongest, most artistic, and most universally applicable substitute at our command to-day, and in all respects is second only to a skilfully adapted "jacket" crown. Indeed, for the average dentist it is more useful, more quickly and easily made, and, moreover, it possesses an advantage over the latter in that immediate replacement in the event of mishap is possible.

Again, this type of porcelain tooth is ideal for artificial crowns, because it affords better form, better color and greater strength than are possible to obtain from the use of facings, and because the presence of an occlusal surface of porcelain instead of gold, on any or all of the posterior teeth, is advantageous not only for cosmetic and hygienic reasons, but for *actual masticatory purposes* as well.

To overcome the shortcomings of the so-called "Richmond" crown, and of the ordinary bicuspid and molar dummy with porcelain facing and gold cusps, in bridgework, the advantages of some form of interchange-

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able or replaceable all-porcelain tooth, more closely simulating the form and color of the natural teeth, were early recognized.

These advantages have been so evident that the more esthetic operator has always hoped for some type of porcelain tooth, and some method of application, which would eliminate the inherent weakness of thin facings, and the objectionable features incident to their use.

As a result of this recognition, many types have been introduced, but until very recently most of them have been of the thin facing variety, and applicable to the anterior teeth only.

While the all-porcelain tooth, such as the Davis, Logan and Justi crowns, has always been recognized as being the nearest approach to an ideal substitute for the natural teeth, yet they were not originally designed to meet the present requirements of crown and bridgework, and hence their use has been confined to that class of cases where more or less temporary results were all that was expected or demanded.

Cement Preferable to Solder.

If the esthetic and hygienic advantages possessed by this type of tooth, however, could be combined with those of exact adaptation, and uniform and adequate strength, and if to these might be added the further advantages of being *cemented* to the basic structure instead of *soldered*, and of being replaceable and more or less interchangeable, it is evident that our efforts would be a nearer approach to the ideal.

The attachment of porcelain teeth or even facings to the metal structure by means of soldering, or even of *direct casting*, is wrong in my opinion. It is a wrong principle because the porcelain is subjected to a degree of heat which must endanger its structural integrity and influence the preservation of its color; because the tooth or facing is thus attached in a stiff and rigid manner at one or two points only, and, being friable, is more likely to fracture under the stress of mastication; and because, in the event of accident, no favorable opportunity for repair or replacement is usually afforded.

You will probably agree with me, therefore, in that the elimination of these objectionable features must necessarily constitute an improvement, and that such an improvement is to be obtained by the use of replaceable teeth attached to the supporting metal structure only by means of cementation.

An experience of many years has proved that this means of attachment is reliable in proportion as the adaptation of the metal to the porcelain may be close and accurate, or, in other words, in proportion as the porcelain may be "boxed up," protected and supported.

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It is stronger when so attached because it is not subjected to any degree of heat, and is not held so rigidly at a single point, due to the adhesion of the cement over the entire surface, and hence it is less likely to become fractured. Furthermore, the color is never changed; those dark blue marginal outlines, due to the penetration of saliva between backing and facing are absent; and opportunity and facility for replacement, in the event of accident, always presents.

Requirements for an Ideal Tooth.

As previously stated, these possibilities and advantages are to be adequately obtained only in some form or type of tooth which presents as much porcelain as possible, this porcelain not being weakened by the presence of metal pins, nor by the provisions for retention, and which, therefore, possesses a maximum of strength; which is of natural form, more or less universally applicable, *and which will require but a minimum of grinding* in effecting the desired and required adaptation.

This latter feature, as applied to the retentive surface, is essential, because in proportion as a given form of porcelain tooth will require but little or no grinding upon this surface in effecting its adaptation to the requirements of the individual case, may it be expected to be replaceable or interchangeable.

These combined advantages, I believe, are to be obtained in a form of tooth suggested by the writer and now known as the "Goslee Interchangeable Crown and Bridge Tooth."

It will be observed that these teeth as now made are of natural form; that they possess the splendid strength and color characteristic of the Consolidated tooth bodies; that they are adapted to single crown work where any form of metal base is used, as well as to intermediate teeth, or "dummies" for bridgework; that they afford a minimum display of gold, and require but a minimum amount of grinding, and that with a sufficiently large variety of molds, they should be almost universally applicable; also that they are strongest where the greatest strength is required; and that they offer ample opportunity for secure retention to the supporting base or structure.

A further advantage made possible by the use of replaceable or interchangeable teeth, which applies particularly to especially difficult cases, is to be obtained by making duplicates, and while it is true that any form of interchangeable tooth is far less likely to become broken from the stress of mastication, yet the making of duplicates coincidently with the initial construction requires but little time, is always a source of inestimable protection to the particular patient, and affords unlimited relief and satisfaction to the dentist. It is therefore a safeguard which might be ob-

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served often and profitably by everyone whose necessarily small fees do not render it prohibitive.

In all instances, however, whether duplicates are made or not, *the color number and mold number of each tooth used in every case* should be recorded on the card or ledger sheet, and thus made a permanent part of the record. Because of these advantages, and for these various reasons, I firmly believe that only some form of interchangeable tooth should ever be used if the best results and highest possibilities are to be attained in our efforts.

In the construction of all forms of porcelain crowns with cast bases, however, and notwithstanding the splendid possibilities offered by the casting process, much difficulty has heretofore been encountered in molding the wax to a close adaptation to both the root-end, particularly at the periphery, and the base of the crown, and in holding the dowel or dowels in the proper position to insure correct alignment.

Technique. These essential features have usually been so uncertain, and in some instances so difficult and so unsatisfactory, as to cause me to suggest a technique which, when used in connection with the Goslee tooth, eliminates such uncertainty, insures accuracy, is applicable alike to all cases, whether a band is required or not; relieves the patient of any discomfort whatever, and which has proven the most satisfactory method of crown construction I have ever followed.

In the various methods now generally used and advocated, good, accurate, reliable results are difficult to obtain, because the very plasticity of wax of any kind makes it possess a tendency to *spread* when subjected to the pressure necessary to mold it to a close adaptation. This tendency is best and most easily overcome by first adapting 38-gauge pure gold or platinum to the root-end, which may be done either by swaging or bur-nishing; and then adjusting the dowel, tacking it to the base with solder, and subsequently molding the wax to both base and tooth, and casting directly to this disc of gold or platinum. If this procedure is carefully followed, the surface thus obtained will always fit more closely to the root-end than would obtain from the molding of wax alone, followed by the use of any investment material now procurable, and will require no finishing whatever after casting.

The use of pure gold is recommended only because of the facility with which a close and accurate adaptation may be obtained with it. Platinum of the same gauge, however, while a little more difficult to adapt, would answer the same purpose, and, provided the same degree of accuracy be obtained, its use would afford an additional advantage in that

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any danger of fusing or burning it in casting to it would be entirely eliminated.

Such a procedure with either metal also reduces to a minimum the possibility of any distortion of form which may result from the warpage or shrinkage of the gold or alloy used in casting, and while the adaptation of the cap may be made by *burnishing*, the very best results are to be obtained by *swaging*. The latter necessarily involves the *indirect* or impression and die method, which is outlined in systematic order in the following steps:



FIG. 1.

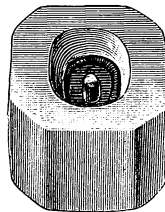


FIG. 2.



FIG. 3.

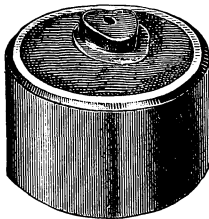


FIG. 4.

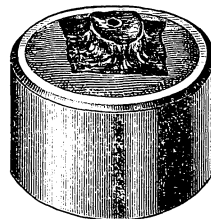


FIG. 5.

Adaptation of Cap to Root-End.

First: Prepare the root in the usual manner, as for any type of porcelain dowel crown. If a full or partial band is desired, all enamel should, of course, be removed.

Second: Adapt a base of thin, pure gold or platinum (about 38 gauge) to the root-end by swaging.

Third: This is to be easily accomplished by taking an impression of the root-end in modeling compound, Fig. 1, investing it in plaster, Fig. 2, and making a die of quick-setting amalgam or cement. An amalgam die is better and much more reliable, though it requires more time. The die should then be trimmed around the periphery with a fissure bur until the root-end is freely exposed. Fig. 3.

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Fourth: Mount the die on the ring of any of the swaging outfits, with modeling compound, Fig. 4, and with the soft rubber plunger of a swaging device swage a cap of 38-gauge pure gold or platinum. Fig 5.

Selection of Tooth.

Fifth: Select a Goslee tooth of suitable size and proper color. The selection of the tooth for the case at hand is best made by having a tray of sample molds, and when one of proper size and form has been selected simply record the formula. Thus, for example, the record slip would read, "*Upper Right Lateral, Mold 51, Color 65.*" If care is

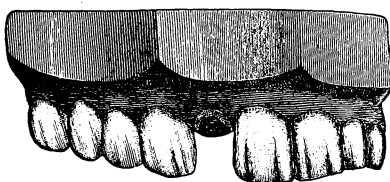


Fig. 6.

exercised in selecting just exactly the proper size and shape, practically no grinding whatever will be required.

In this connection, it would be better to select a formula just a trifle too small than one too large. If the exact size is not obtainable, small additions in length or width may be easily made in one bake, using any of the lower fusing bodies. Such additions are better than selecting a tooth which is too large, and having to grind it. Little or no grinding should be resorted to, as these teeth are replaceable or interchangeable only in proportion as they may be used without grinding.

In the absence of sample molds, an impression should be taken in wax or modeling compound, and a model made in plaster-of-Paris. Fig. 6. The selection may then be made upon this model, but greater accuracy is to be obtained in the use of sample molds directly in the mouth.

Adjustment of Dowel.

Sixth: When the tooth has been selected, the canal should be enlarged to receive the dowel or post. This should be cut to a length which will enter the root to a sufficient depth, and then engage and hold the tooth in its exact relation to the root. In single-rooted teeth a slight enlarging of the canal, or slight bending of the dowel, or both, will usually sustain the tooth in its proper alignment. In upper first bicuspidis one dowel is usually all that will be required, but this should be placed in the *buccal* canal.

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Iridio-platinum or clasp-metal dowels are preferable for cast work, though the nickel alloys may be used.

The dowel should be round, and not smaller than 14 gauge, though the end entering the canal should always be *tapered* to conform to the size of the root.

In casting to clasp-metal dowels, care must be exercised not to over-heat the flask just before casting. Those who cast into red hot flasks, which is a mistake, often find that their clasp-metal dowels are melted



Fig. 7.

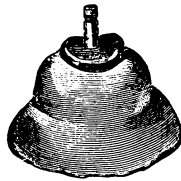


Fig. 8.



Fig. 9.

and absorbed into the casting, due only to an excessive heating of the flask in melting the gold. If the casting may be made into a flask only moderately warm, however, these alloys will withstand contact with molten 22-karat gold, but otherwise iridio-platinum pins and dowels should be used.

Adjustment of Tooth.

Seventh: When the dowel and tooth have been thus adjusted, the thin cap of pure gold or platinum should then be placed in position on the root, perforated to receive the dowel, and the latter, in position in the crown, forced to place. The tooth should then be removed, and the relation between cap and dowel sustained with wax or temporary stopping. Fig. 7. The two should then be removed from the root and invested with a very small bit of soldering investment material. Fig. 8. When this is hard, the dowel should then be tacked to the cap with a small bit of 22-karat solder, which will insure their permanent relation. Fig. 9. Cap and dowel should then be adjusted to position on the root, and finally trimmed and burnished to the desired accuracy of adaptation.

Eighth: The crown should then be ground to a close joint along the labial or buccal edge, and other requirements of adaptation completed. The base of the crown should now be painted with glycerine or thin oil, a small piece of soft, clean wax placed on the cap, and the crown then forced to its exact position in relation to the cap. The whole may now be removed from the root, and the space between metal cap and porcelain teeth filled with melted casting wax, preferably of a hard character. All

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surplus wax should now be nicely trimmed away, and the porcelain crown then carefully detached, which is made possible by the lubricating oil.

No. 30 gold foil placed in direct contact with the porcelain tooth before filling the space between it and the cap as a means of facilitating the removal of the crown from its base, has been suggested by Dr. Ottolengui, and may be used with good results.

Investing and Casting Base.

When the porcelain crown has been loosened from the base, but before it has been removed, the sprue-former should be *securely* attached to the thickest part of the wax. The crown may then be

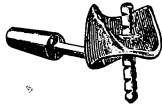


Fig. 10.



Fig. 11.

removed, the base (Fig. 10) invested and cast, always using a clean, well refined grade of about 22-karat gold for the casting.

Duplicates.

When the casting has been made (Fig. 11), it should be cleaned in acid and finished. If duplicates are to be made, a crown of the same mold and color should now be ground to fit the cap. The original should then be cemented to the base and the crown polished.

Ninth: Whenever it is absolutely impossible to have a single dowel fit the canal, and at the same time support the crown in proper position, the surplus end projecting through the cap should be cut off close to the cap, leaving just a sufficient length to insure strength. A separate short dowel, such as is made for dummies for bridgework may then be used to support the crown, and should be placed in position in the crown, any unnecessary surplus cut off to permit of proper alignment, the porcelain then lubricated, and the relation sustained in wax, as previously indicated, where a single dowel is used.

Soldering Instead of Casting.

Tenth: In cases where the space between the cap and the base of the crown is very small, or where it may not be convenient or seem necessary to cast the base, good results may be obtained with solder.

In such cases the porcelain tooth should be backed up with 38-gauge pure gold by burnishing or swaging (Fig. 12); the crown and backing

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(Fig. 13) then placed in position in relation to the cap, the porcelain removed, the case invested, and the space between cap and backing then filled with 22 or 20-karat solder.

This method is particularly useful in very short bicuspsids, but where there is sufficient space to permit of casting, such a case is better and more uniformly strong.



FIG. 12.



FIG. 13.

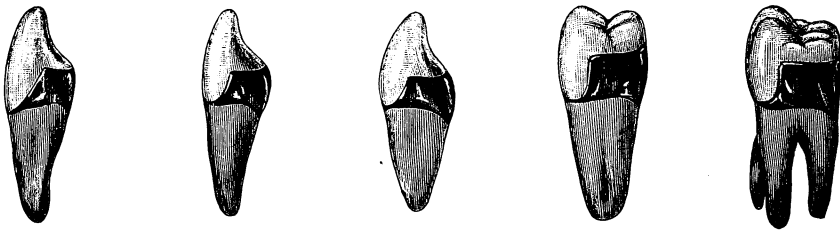


FIG. 14.

The entire process reduces crown construction to a definite system, requires but little time, is simple, insures a more or less perfectly adapted base, and one which is obtained without the slightest discomfort to the patient, which is not possible when *burnishing* directly to the root-end is attempted.

For single crowns a very narrow lingual and approximal band is usually all that will be required. This strengthens the attachment between crown and root, and precludes the possibility of subsequent fracture of the root—for which purposes a band is usually used, but in all cases where the crown is to be used as a bridge abutment a *full* band should always be used.

The construction of a crown by this method usually involves but three short sittings, and the best results are to be obtained by doing all the work directly in the mouth. At the first sitting the root is prepared, the root impression taken, the mold number and color selected, and a temporary crown mounted.

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This latter feature is desirable as a means of packing the soft tissues away to afford and insure a free exposure of the root-end at the next sitting, as well as to relieve the patient of the temporary embarrassment.

The amalgam die having been made, and the pure gold disc swaged and tooth selected *in the meantime*, at the second sitting the cap is fitted to the root, the dowel and tooth adjusted to the requirements, the dowel then soldered to the cap, and the relation between the tooth and cap secured with casting wax. The crown is then cast, the tooth cemented to place and finished, and the final mounting is made at the third sitting.

A series of typical crowns constructed along these lines is illustrated in Fig. 14.

Some Cases from Practice.

L. P. HASKELL, D.D.S., Chicago, Ill.

About fifteen years ago a patient was sent to me from Montana for an upper denture, in whose jaw, peculiar in its character, excessive absorption had taken place. On the right side, in the region of the bicuspids, bone had been removed on account of necrosis, so was hard. The rest of the ridge was simply thick membrane, yielding to pressure. The palatal surface was flat and hard. It was not an inviting case. He said six sets had been made, all of rubber, by different dentists, but without success.

I made my usual "relief" over the palate, not by scraping the impression, an unsatisfactory because uncertain method, but by the use of sheet wax on the model. As the flexible ridge would yield to pressure on closing the jaws, bringing the plate to hard pressure at that point, I placed a slight relief there.

A plate of aluminum was swaged upon a Babbitt metal die. Upon placing in the mouth, moistened, and pressed snug (no sucking by the patient), in the effort to remove it an instrument had to be used on the side at the rear.

As the patient was desirous of having his features restored, and having a long lip, a very long bite was required. This, of course, increases the leverage. The case was, however, a complete success. He wanted two sets, a reserve in case of breakage.

After he had gone, as it was such a peculiar case, I made a set to keep. Ten years later he had lost his extra set, and wanted another, remarking that he often forgot he was wearing artificial teeth. I took from

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the drawer the set I had made after he had gone home, and which had never been in his mouth, and, placing it there, called another dentist to examine it. Upon doing so he attempted to remove it, but found it required force to do it.

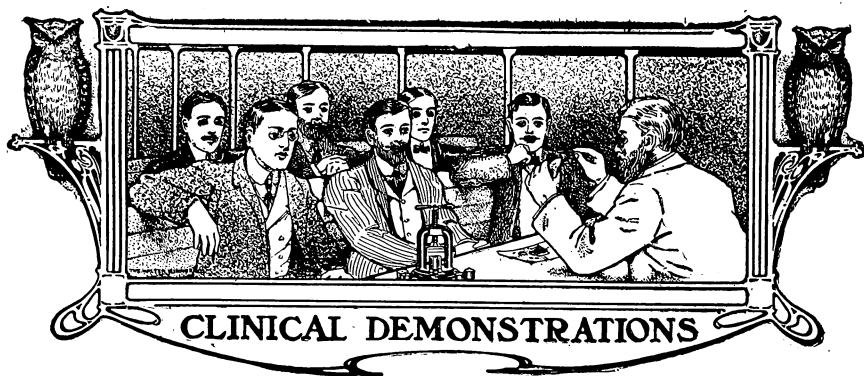
This is an illustration of what I often have said, that with flat, ridgeless upper jaws, I have better success with swaged, not cast, metal plates, than with rubber. In fact, I enjoy making sets for the flat jaws.

During the Garfield presidential campaign, a speaker came on from Philadelphia, recommended to me by a dentist, for a set of teeth, as he was on his way to Wisconsin for the campaign.

Here was a jaw resembling the other, in some respects more unfavorable. It was one of a small proportion of cases where the palate is soft, and when so there is usually a crevice through the center. In these cases no relief nor vacuum cavity is used, but the plate was fitted snugly to the whole surface, no scraping whatever. I made a rubber set, but it was not satisfactory to either of us. I swaged a gold plate, and it was a complete success. He left a few days after, and on his return home, three months later, called and said he made speeches every day while absent, having no trouble whatever.

Another case, showing the durability of the continuous gum denture when properly constructed. A lady, eighty years of age, came to me for a new set of this work. She was wearing a set which I had made for her forty-five years previous. Old as she was, she would have nothing else, although cheaper work would have answered the purpose. Here was a set of heavy bridgework worn with comfort all these years, and without vacuum cavity, only the "relief."





Some Comments on the Diseases of the Antrum of Highmore, with a Brief Description of the Surgical Treatment of Its Diseased Conditions.

By SAM GOLDSTEIN, M.D., Senior Surgeon, N. Y. Throat, Nose and Lung Hospital,
and C. JOHNSTONE IMPERATORI, M.D., Surgeon, N. Y. Throat, Nose and Lung
Hospital, New York.

Clinical Lecture before the New Jersey State Dental Society.

The subject of accessory sinus disease, and the treatment thereof, received its greatest impetus abroad through the work and splendid achievements of Killian; in America this work has been carried forward by modifications in technique and greater courage in delving in and cleaning out all of the diseased sinuses, with the least possible deformity.

Our task is made rather difficult in this instance, having been assigned to discuss the treatment only of the diseases of the maxillary sinus; as we so seldom find the antrum without one or the other of the chain of sinuses diseased in the chronic form, viz., that condition that admits only of the most radical surgical intervention to ensue eradication of the pathologic phenomena.

Under such conditions no permanent cure of the suppurating antrum can be anticipated, even after the most radical surgical intervention, unless all the other diseased sinuses of the accessory chain have received similar treatment.

Primeval man demanded highly organized olfactory organs, and the accessory sinuses are the remains of this chain, but bereft of the distinctive functions for which they were especially designated.

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In man to-day the sinuses are decidedly smaller, and have much narrowed openings for drainage.

It is from this fact that acutely diseased sinuses pass, through lack of drainage through these small channels, if untreated, into the chronic type of disease that demand the radical treatment.

Thus we see that among the general causes of sinus disease, inflammatory changes in the mucous membrane lining these cavities and interfering with drainage and ventilation, are of special importance.

Constitutional dyscrasia, as syphilis and tuberculosis, a carious process in some adjacent part produced by diseased teeth, can readily produce sinus inflammation; fistulous tracts leading from diseased teeth often produce suppurating disease of the antrum.

Nasal disease, whether or not depending upon intranasal interference from resulting tamponade, following operative interference, often results in sinus disease.

Frontal sinusitis and ethmoiditis (less often sphenoidal sinusitis, the products of which are more liable to drain into the nasopharyngeal space), with their purulent discharges into the middle and inferior meatuses, are the causative factors in maxillary sinusitis.

The mucous membrane of the sinuses, normally about $\frac{1}{25}$ of an inch in thickness, may become enormously swollen and edematous, undergo polypoid degeneration, and be studded with masses of polypi, so that the mucous membrane of the antrum, resulting from these inflammatory changes, has been found to be $\frac{3}{8}$ of an inch in thickness. The discharge is at first thick, whitish in color, composed of mucous masses, showing embedded therein numerous leucocytes.

Later we have an offensive odor from invasion of the *bacillus fetidus*. This offensive discharge is more often found in the antrum, from infection, secondary to diseased teeth.

The most constant symptoms of the diseased antrum of Highmore are pain and discharge. The pain may be only a dull ache, or become a continuous, persistent, throbbing pain, that radiates over the malar region—the vertex of the head, the mastoid area or any part of the occipital bone.

The discharge, as before described, is at first a thick, whitish, gelatinous, muco-pus: in the later stages, especially, if the disease is caused by a carious tooth, the discharge becomes thinner and of an offensive odor.

To locate antral disease, the patient's history must be accurately sought, the nares carefully examined: transillumination is not of first importance, but valuable as corroborative evidence of disease.

The X-Ray picture will afford valuable aid in determining the dimen-

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sions of the antrum, the presence of thickened mucous membrane, pus, bony growths, and, when present, the existence of a tooth or teeth as a causative factor of disease.

We will at once pass to the treatment of acute and chronic disease of the antrum of Highmore.

Treatment. In the acutely inflamed antrum the intranasal operations are usually successful, and rarely is it necessary to resort to radical procedure.

Acute inflammation of the antrum will frequently subside after puncture, through the inferior naso-antral wall, provided that the opening is large enough to allow proper irrigation, sufficient drainage and ventilation.

Frequently the same conditions, producing disease of the other sinuses (and they are rarely affected singly), we find as a cause in antral disease the blocking up of the normal opening.

We must take into consideration those structures that are within the zone of the normal openings in the surgical treatment of the diseases of the antrum, the middle and inferior turbinated bodies and the naso-antral wall. The anterior ethmoidal cells, the frontal sinus and the antrum of Highmore, all drain into the infundibulum, and any obstruction in this region will stop the normal drainage from these sinuses. This is what has been called by Ballenger "The key of the vicious circle of the nose."

In acute cases the removal of morbid tissue from this region usually will be sufficient to stop the progress of the inflammation and allow proper drainage. However, there are certain types of cases in which the disease of the antrum does not subside after simple puncture and irrigation and establishment of drainage by the normal openings. It then becomes necessary to remove the anterior portion of the inferior turbinate, and remove enough of the lower part of the naso-antral wall that the opening will not close before the diseased mucous membrane has regenerated, and not to remove too much, for then a permanent opening might result, necessitating a plastic operation at some later period. This type of operation in acute and sub-acute cases usually suffices to clear up the diseased conditions. Many instruments have been devised to do this operation.

As our efforts are directed in securing sufficient drainage of the diseased contents of the sinus, the result is the same, whether we saw through the naso-antral wall and remove a button of bone, or use angular chisels or a forward biting forceps.

The operations to be described will only be those which might essentially be termed operations of choice.

The extra-nasal operation is a more radical procedure, and is the

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one usually elected in attacking a diseased antrum in the chronic stage, or rarely, an acutely inflamed one.

The alveolar or Cooper operation we merely mention to condemn. This operation consisted in the removal of the carious tooth, usually the second bicuspid or first or second molar, and enlarging this opening in the alveolar process with a gouge or a boring instrument. This operation should only be done after consultation with a dentist, and when it is his opinion that the tooth causing the infection of the antrum is beyond repair. The removal of a perfectly healthy tooth to get drainage from the antrum is poor surgery. As Ballenger says "The palatal operation may be dismissed without detailed description."

This method could only be considered provided there existed a perforation from the antrum to the mouth. The Kuster operation consists in chiselling through the anterior wall of the antrum and exposing its interior to allow a complete curettage of the cavity. However, the operation usually performed is the Caldwell-Luc and, though more radical than the Kuster operation, is usually successful. This operation consists in the removal of the anterior antral wall, as described in the Kuster operation, and then removing the naso-antral wall and the anterior two-thirds of the inferior turbinate.

The Denker operation may be mentioned, but as it is so radical a procedure, it is rarely done. Essentially this operation is the same as the Caldwell-Luc operation, but the anterior angle of the sinus on the nasal side at times is very hard to reach with the curette, and thus diseased mucous membrane is left. The Denker method removes all the bone in this region, thus converting the nose and the antrum into one large cavity.

The Canfield-Ballenger operation is a radical procedure, similar to the Denker operation, but preserves the inferior turbinated body. The incision is made through the whole length of the naso-antral angle or margin of the pyriform opening. Elevate the muco-periosteum over the canine fossa and open the naso-antral angle with a gouge or rongeur. Remove the bone only under the attachment of the inferior turbinate. The opening should be large enough to permit sufficient curettage of the cavity.

To conclude, in acute conditions of disease of the antrum, puncture and irrigation, with proper attention to any systemic complications that may be present, will often procure a cure.

In chronic conditions, however, especially after the above line of treatment has been followed out as indicated under acutely infected cases, and no results have been obtained, any one or combination of operations described under radical treatment will prove satisfactory.



Report of Clinics Given Before the New Jersey State Dental Society.

A.—Permanently Obtunding Sensitive Erosions.

**B.—Use of Alypin Locally for Painless Extractions,
By H. G. Lansing, D.D.S., New York City.**

Operated on three patients by applying formalin to the cervical margins where sensitive erosions occurred, alternating with a stream of hot air in the most severe cases for about ten minutes. The mild cases required less than five minutes of the hot air alternation.

This treatment is effective without the drawback of discoloration, and is almost painless.

The alypin used for extraction was administered by hyperdermic, a 4% solution being used. It has the great advantage of being absolutely harmless, no matter how large a quantity is used, and, in my experience, under all conditions.

A.—New Method of Treating Fractures of the Jaw.

**B.—Use of Hyperaemia, Induced by Suction Plates,
to Promote More Favorable Prognosis in Staphylorraphy.
By H. J. Kaufer, D.D.S., New York City.**

New methods of treating fractures of the jaw were demonstrated with plaster casts and X-ray pictures from practical cases.

Case 1. Patient presented. Female, age 34, congenital cleft palate. For eighteen months prior to the operation the patient wore a hyperaemia plate, such as suggested by the author. This hyperaemia plate greatly increased the vascularity of the tissue, as well as reducing the size of the cleft, and made a staphylorraphy possible. The operation consisted of freshening and approximating the edges of the cleft, with mattress sutures of silk-worm gut. Muco-periostial flaps were obtained from the hard palate, but no relaxation incisions were deemed necessary in the soft palate. This was largely due to the use of the hyperaemia plate, as prior to its application several surgeons, whom the patient consulted, considered the cleft too wide to close by staphylorraphy. The patient now has a well-formed velum and a bony roof to her mouth.

Case 2. Male, age 24, gunshot wound. The bullet entered in the region of the temporo-malar canal on the right side, passed through the head and out through the cheek at a place which can be described by a circle, the diam-

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eter extending from the distal border of the canine tooth to the maxillary tuberosity. The bullet being one of large calibre, mushroomed out as it passed through, and deposited numerous splinters of lead throughout the entire track; it destroyed about two-fifths of the superior maxilla, including one-half of the roof of the mouth. The operation consisted in removing all fragments of lead, all segments of bone, which were isolated from healthy periosteum, and such soft tissue as showed signs of slough. By plastic surgery the perforation in the cheek was completely closed, and as much tissue as could be safely drawn into place was used to cover the roof of the mouth. Subsequent to this operation the author applied his hyperæmia method, and the prognostications for a complete recovery are extremely favorable.

Porcelain Faced Crowns.

By Albert W. Twigg, D.D.S., Ossining, N. Y.

This method is neither new nor original with me, but has much to commend it in many cases in the anterior teeth. Dr. W. A. Capon, of Philadelphia, has urged its value for a number of years.

Its value lies especially in its adaptability to teeth too badly broken down to fill permanently, or those cases where the teeth are of such a character that filling is impracticable except in a temporary way, but when conditions are not such as to warrant the use of one of the pin crowns.

Selecting a tooth to be preserved (the pulp need not be extirpated necessarily), grind to a conical shape a trifle more on the labial surface and fit a ferrule of No. 34-gauge platinum plate, soldered with pure gold, leaving the cutting edge open. On the surface of the ferrule is baked a veneer, one of these especially made, if available; if not, any pin tooth, grinding away the pins and pin surface until thin enough to supply the portion of the natural tooth ground away.

After I have obtained a satisfactory facing, I usually place some of the mixed porcelain on the face of the platinum, allowing it to fill at the same time the open end of the ferrule; place my veneer on the thin stratum of porcelain, and remove with thumb and finger.

If one would prefer not to spend the time at one sitting, the ferrule may be fitted, an impression taken, and the facing fitted to the platinum on the plaster cast.

If a pin tooth is ground to make a veneer, a little darker shade should be chosen, as the grinding away of so much of the body makes a slight difference in the shade.

I have had the best success with the "Jenkins Prosthetic Porcelain," which seems to adhere very securely to the platinum, but any high fusing porcelain may be used.



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The Adhesive Joint in a Hygienic Filling.

By Levi C. Taylor, D.D.S., Hartford, Conn.

That the adhesive joint in a filling is fast proving to be better than the attempt to press either gold or amalgam against the walls of the tooth, there can be no question. Porcelain inlays and cast gold inlays are good, and many times the more desirable filling, we believe. That the above are more expensive, many can testify. That the modern hygienic filling, which is composed of quite a little cement, with gold cylinders of as large a size as can be well used, setting the cylinder in endways, using both hands to gently press the gold into the cement, allowing the cement to press up between the layers, and then trimming the edges and welding up to a finish, is much more practical there can be no doubt, as no one who has ever mastered the technique has ever abandoned its use.

X-Ray Diagnosis in Dentistry and Oral Surgery.

By G. E. Pfahler, M.D., Caldwell, N. J.

By means of the Roentgen Rays and good technique, practically any lesion about the teeth or jaws can be demonstrated. This method of diagnosis is seldom necessary in affections of the crown, but even here a cavity may be recognized between two closely set teeth, that might be overlooked ordinarily. Below the crown any obscure condition demands an X-ray examination. Abscesses in the roots and in the alveolus can be clearly demonstrated. Sinuses can be traced to their sources. The position of unerupted teeth can be determined, and, if faulty, can be early guided to their proper position; if absent, mechanical appliances can be used to aid in the normal development of the jaw.

Impacted teeth can be diagnosed, and the best line of treatment be determined before operating. One can decide whether it is best to sacrifice the impacted tooth or the adjacent one, whether by means of mechanical appliances it can be made to erupt properly; or whether an excision of a portion of the jaw will be necessary.

Diseases of the bone, such as abscess, cysts, osteo-myelitis, carcinoma, sarcoma, actinomycosis, etc., can be demonstrated and properly treated, and, in my opinion, no operation should be undertaken on the jaw-bone until a careful X-ray examination has been made, and the full extent and location of the disease determined. Too often have I seen the folly of such operations, when a subsequent examination showed clearly that the surgeon had only removed parts of the disease.

The above facts and many others were demonstrated, but the whole subject can be put in a few words—*"When in doubt, have an X-ray examination."*

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Orthodontia and Orthopedia of the Face.

By U. H. Jackson, M.D., D.D.S., New York.

A clinic by V. H. Jackson, M.D., D.D.S., N. Y., was given describing his system of orthodontia.

His method of equalizing the dental arches was shown with models and appliances mounted on boxes arranged for describing the action of the apparatus, and how the apparatus could readily be removed from the teeth by the patient, by unhooking wire clasps that were arranged to engage with lugs on gold collars cemented to the teeth for anchorage.

About forty models with appliances were shown and described, showing methods of expansion and contraction of the dental arches, moving incisors and other teeth outward, inward and laterally, and for other purposes.

He showed his method of reducing orthodontia to an exact science by the use of a tracing card with which he demonstrated, that by making accurate and recorded measurements of a tracing, he could secure any amount of change in apparatus for causing the desired progressive force.

In this connection, Dr. Jackson also described how he designs and makes a permanent record of apparatus to be made and used for practical cases. This permanent record is brought about by the use of an improved carbon triplicating book. There are three copies of the design made. One copy is used as instruction for the laboratory man, the other copies are retained as permanent records.

Many other plans and descriptions of apparatus were presented.

Marshall Crown, Using Platinum Staple.

By D. G. Farrington, D.D.S., Caldwell, N. J.

A Marshall crown is a crown made of gold covering the lingual and approximal surfaces of a *vital* tooth, without an unsightly display of gold on labial surface, used as an abutment in bridgework. It is generally confined to cuspid and bicuspid teeth, but in certain cases can be used on incisors and molar teeth.

For cuspid, grind off approximal and lingual bulges of the tooth, making the approximal surface flat. At about the middle of each approximal surface, with No. 557 square end dentate fissure bur grind a groove, parallel as near as possible with the long axis of the tooth, these grooves being united by a similar groove over lingual surface. The groove should be of such a size that a staple of No. 19 iridio-platinum wire would fit it nicely.

With staple in place, pure gold of thickness to be easily burnished—say 35 to 32 gauge—should be burnished to approximal and lingual surfaces of the tooth, having it pass just under the gum margin, leaving

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slight excess all around. Remove gold and staple, and place staple in imprint caused by burnishing, and tack at one point—say in middle—with 22 karat solder, then replace on tooth and reburnish. Remove and tack staple all around without excess of solder. Replace on tooth and burnish again. Remove, invest and sweat 20 karat solder over gold, leaving edge free to be burnished to tooth in final setting.

The casting process can be applied to the making of this crown with or without the staple, but, to get best result, must be made of soft gold (pure or 22 karat) to allow final burnishing.

The construction of bicuspid crown will readily suggest itself, the formation of the cusp being the essential difference. First, grind off lingual cusp; make groove over buccal cusp as though it were a bicuspid. Tack the staple about one-sixteenth of an inch from one end of a strip of 22 karat gold, width about same as for a two-piece crown. Place in position, and draw tight. Remove and draw gold, the width of a line further on, to make tight fit. Swage cusp to fit band, then let patient bite for occlusion. Remove and fill lingual cusp with solder, attaching cusp and band together at same time. Replace and burnish to buccal cusp, and crown is completed.*

The Use of Chloro-carboline in Cavity Preparation.

By Stephen Garrison Wallace, D.D.S., Lakewood, N. J.

After syringing out the oral cavity with hazelox, Dr. Wallace demonstrated that he could obtund the most sensitive dentine with chloro-carboline, cut, to fill, or crown the teeth painlessly, at the same sitting. He also used the same medicament for capping the pulp. This he did with two patients, a left lateral for a young man, and left lower molar cervical margin, in a wet field, for a woman, by saturating cotton placed in the cavity and waiting ten minutes. The cavities were found and examined by those who witnessed the clinic.

The doctor exhibited in his own mouth cervical margin fillings in three molars, and anterior and posterior fillings and a bridge for the centrals, that he did for himself, painlessly, five years ago with chloro-carboline.

Painless Pulp Removal.

Edward C. Taylor, D.D.S., South Orange, N. J.

Patient No. 1. Woman about fifty; lower left cuspid; broken down, vital tooth. Sprayed tooth with ethyl chloride from Gebauer's tube, cut through one-sixteenth of an inch of dentine and exposed pulp

*From the description here given the Marshall crown seems to be a close relation, if not a lineal descendant, of the Carmichael attachment.—Ed.

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with engine, patient feeling nothing. Applied Parke, Davis & Co.'s tablets of adrenalin and cocaine No. 151 with pressure; opened pulp cavity with bur and removed pulp.

Patient No. 2. Woman about forty years of age; severe odontalgia in upper first bicuspid. Sprayed cavity with Gebauer's ethyl chloride, exposed pulp freely with large spoon excavator. No pain. Applied adrenalin and cocaine as before. Fully opened pulp chamber with large round bur in engine, removed pulps from palatal and buccal roots.

In both cases dressed root canals with carbonol on cotton, and inserted fillings of temporary gutta-percha.

NOTE.—The nebulizer on Gebauer's tube gives a very fine spray that gives no shock. All other tubes I have seen lack this important feature, and therefore give a painful shock.

A New Pyorrhea Splint.

By Arthur B. Crane, D.D.S., Washington, D. C.

As a means of holding the lower anterior teeth, the pulps are destroyed and iridio-platinum posts are fitted into the canals. The upper end of these posts is threaded to fit Bryant nuts, and the orifice of canal is enlarged with the bur of the Bryant outfit, and the posts with the nuts fitted are adjusted to position and ground to conform with the contour of the teeth. Impression is taken, removing the posts with it, and model made. Half-round clasp wire is bent to conform with the curve of the arch and soldered to each nut. The piece is then cemented to position.

Polishing Teeth with the Engine, Using Rubber Points.

By R. G. Hutchinson, D.D.S., New York City.

Dr. Hutchinson demonstrated his method of polishing the teeth after instrumentation, using soft rubber points and cups, and ribbon floss, all charged with pumice. By this method more perfect results are obtained and less injury done to the soft tissues than by the use of other engine polishers or orange-wood points. The operation occupies much less time than by the hand process, but the saving of time is of minor importance as compared with the other advantages, especially at the cervix, under the gingival margin, which must receive a perfect polish without injury to the gum tissue.

An Aseptic Hair Protector for Enclosing Ladies' Hair During Dental Operations.

By Geo. M. Holden, D.D.S., Hackettstown, N. J.

The protector made of fine, durable material, has been sterilized and packed in a sealed envelope. It consists of a circular piece of lawn



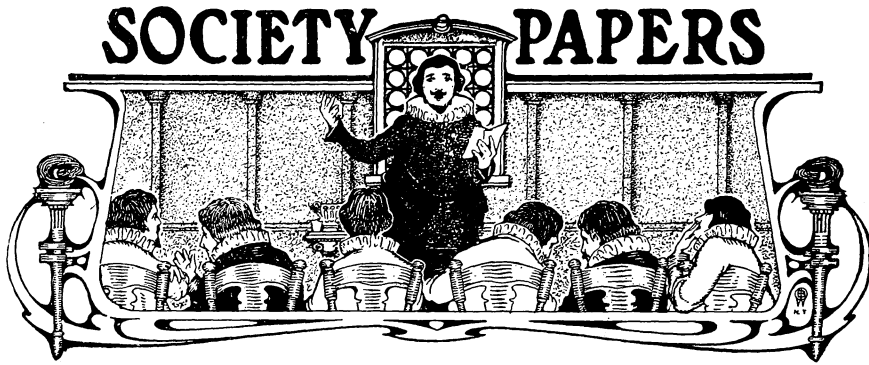
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with a hem at the periphery and two buttonholes. Tape passes through the hem, and both ends extend from the buttonholes. It is used by drawing each end of the tape until it is about the size to enclose the front hair. The front is put on, and the edges are brought above the ears and under the back hair. Both ends of the tape are drawn firmly, and tied in a bow-knot at the back of the neck.

It is put on when the patient gets in the chair, and is removed before she leaves it. It is then folded and placed in a legal size white envelope that has the patient's name marked on it. It is kept for her use and, when through with the series of appointments, it is laundered. The hair is confined, and always out of the way of the operator. Combs and pins are always held in place, and hairdressing in the office is found unnecessary.

The object of the device is to add to cleanliness, to save the ladies inconvenience and discomfort, and to save the dentist time and annoyance.





The Prophylaxis of Dental Caries.

By EDWARD C. KIRK, D.D.S., Sc.D.

(Dean Dental School, U. of P., Philadelphia, Pa.)

Lecture before the Central Dental Association of Northern New Jersey.

We all recognize certain fundamental facts about dental caries. First and foremost we all must admit that it is dental caries above everything else that has called the dental profession into being; that is to say, were it not for dental caries it is doubtful whether there would be a dental profession—that is, as we understand it—and I say this with all due respect to the important claims of pyorrhea alveolaris. (Laughter.)

But it is dental caries that is the universal disorder. It is the most striking dental disorder; it is the one that is the most evident in its effects and far-reaching in its results, and ever since there has been a dental profession the principal efforts of that profession have been directed toward the cure and prevention of dental caries; as the result of this effort and of the demand that we should make this effort, it seems that we have at last attracted the attention of the public. As a matter of fact, we have been drumming at the public ear ever since we have been a profession, telling them what we could do in the matter of treatment of dental caries. We have continued preaching the gospel of the care of the teeth until at last the public seems to be in the attitude of asking, "What is it you can do as a dental profession to arrest this destruction of teeth by decay?" And the thing that has been interesting me for some years past is the kind of answer we will be able to make to this question.

I am dealing with this question now from the standpoint of the old Methodist experience meeting; I am trying to open my heart to you on

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this topic, and the answer which, it seems to me, the dental profession is thus far making to this public and universal demand is something like this: "Why, it is simple enough; we are going to give you more dentistry, and we are going to save your teeth by preaching this gospel of oral cleanliness; by ringing the changes upon the statement that 'Clean teeth will not decay'; and thus we propose to prevent decay of the teeth in the future." But I ask you to consider with me frankly and honestly whether that which we promise can be fulfilled by the means now at our disposal.

I have been interested to notice that here and there over the country and in various parts of the world there are honest doubters as to whether it is true that this gospel of prophylaxis, this promise of more dentistry for the public, will really accomplish that which we assert that it will accomplish:

**Will Present
Prophylactic Measures
Prove Effective?**

Notably in New York, less than a year ago, at the Institute of Stomatology, a very important paper, from every point of view, was presented by Dr. J. Morgan Howe, in which he raises the same sort of inquiry. More recently Dr. Bunting, of Ann Arbor, presented a paper in Schenectady, New York, dealing with this same question, and I am pleased to find that some of these men are beginning to rehearse the foundations of our professional creed, and to inquire as to their soundness, and as to whether we are proceeding altogether along right lines.

I think we may lay it down as an axiom that until we really know the cause of a disorder, we are not in a position to intelligently undertake its cure or its prevention. And we may ask: Do we yet know the cause of dental caries? Everybody says, "Yes! that was settled years ago, a quarter of a century ago, by the researches of Miller and those who worked with him in that effort." Certainly it has been announced over and over again that Miller discovered the cause of dental caries—and that settled it. Do not misunderstand me if I ask if that be true. I wish to have it clearly understood that when I speak of Miller's discovery and Miller's work I speak reverently, as I would speak of the work of any great man. But I am referring more particularly to our deductions from his findings when I ask if we have really discovered the cause of dental caries. What was it that Miller did?

Remember that the reports of Miller's research were published at just about the time when the work of certain great investigators in bacteriology was published, and when the truth of the germ theory of disorders had been proven to a demonstration; a result made possible through the culture methods devised by Prof. Robert Koch, of Berlin. It was the application, as we all know, of Koch's methods by Miller to his

**The Causes
of Dental Caries.**

inquiry into the cause of dental caries that made it possible for him to work out to a finality what might be called the intimate nature of the process of caries, and what Miller did was to demonstrate that the disorder that we know as caries is produced by the activity of certain bacteria, or a group of bacteria, having the power of converting certain substances into an acid end-product, namely, lactic acid; and he demonstrated his theory to be true by reproducing the disorder artificially in conformity to the postulates laid down by his great master, Koch, viz.: that in order to prove or determine that a disorder is of germ origin, it is first necessary to demonstrate the existence of the germs in the tissues, to cultivate those germs in pure culture, and to reproduce the disorder or lesion in a sound tissue. That Miller did with dental caries, and he showed that the pabulum, or the material upon which this group of lactic acid bacteria is nourished is a certain type of carbo-hydrate food material; and there, as far as that phase of the matter was concerned, it rested, so that when the announcement of his findings was made we all had the feeling that the great problem of the ages had been settled, and that we had learned what the cause of dental caries is.

Nothing that has been said since that time, so far as I am able to see, has added one iota of further guidance to us in the application of this finding to the very important and very practical problem of the prevention of dental caries.

It must be borne in mind that the source of the food supply for the cultivation of caries-producing bacteria in Miller's researches was, generally speaking, the decomposing food débris of the individual, and in carrying out his research he worked in harmony with a very much older theory, a theory which was held from times of antiquity. In fact, I have in my own library a little book in German, dated 1530, in which the statement occurs that "Caries of the teeth is a disorder of the teeth caused mostly by adhering particles of food which undergo decomposition and generate thereby a bad acid moisture which attacks the tooth and removes it particle by particle, so that the tooth becomes full of holes and finally falls away, not without much pain." It is interesting to add to this quotation the directions given for the cure of this disease—that "In order to preserve the remaining portion of the tooth the cavity should be scraped and cleaned with a delicate knife or chisel, as by practitioners is well known, and the remaining cavity filled with gold foil." That was in 1530!

I had the pleasure of reading this statement in the old German publication to W. D. Miller, and after I had read it to him in my own den, and looked him squarely in the face, I said, "Well, now, you X. Y. Z. scientific man, discoverer of the chemico-parasitic theory of dental caries, what

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have you to say to that?" and he smiled a peculiar quizzical smile and replied, "Well, Kirk, there were pretty good guessers in those days, were there not?" (Laughter.)

It was a guess if not a prophecy, but none might say that it anticipated Miller's discovery, though it did foreshadow it. It was not anticipating it, because it was a guess, while Miller demonstrated the fact.

But my query is, "How has the general profession profited by this knowledge?" What has it availed us in the matter of eliminating dental caries? I called your attention a moment ago to the fact that Miller, in making his demonstration, had connected the factor of the food supply of the bacteria concerned in the production of dental caries with this ancient theory, that the destructive agency came from the fermenting adherent food particles about the teeth. We have always looked in that direction; if you come to think of it, all the articles on this topic in the literature of dentistry have to do with the fermentation of food particles in and about the teeth, and it is out of that we gather mainly our axiom that if we keep the food particles away from the teeth we will have no lactic acid formation, and therefore no decay. Is not that true?—is not that what we are doing, and what we are thinking? And are we not claiming that by constantly cleaning the teeth of these adherent food particles we will avoid the decay of the teeth? Has not that been the slogan; has not that been the trend of our thought about prophylaxis?

There was once a time when I raised a family and supported them through my efforts at the dental chair. I have not always been the wild theorist that you have under observation now; I was once a practical dentist. I mention that because one of my students not long ago came to me and asked me if I had ever practiced dentistry. (Laughter.) I did at one time practice dentistry, and I made a decent living at it. I did not cure all my patients of pyorrhea; I did not arrest all bad cases of decay, and I want to confess to you that not all the upper cases of teeth I made were a successful fit. (Laughter.) Two or three of the fillings I put in subsequently failed at the cervical margin. In fact, I was like the rest of you, and I mention it simply to show I was merely a human dentist. (Laughter.)

**Do Cleaned
Teeth Never
Decay?**

But I remember this: That in the early portion of my professional career a patient came to me who had been serially treated at the hands of two other men; and they were good men, men whose work as operators you all respect, even if you should question mine. This patient gave systematic and intelligent care to her teeth. She became a nuisance in the office because she gave so much care to her teeth, and demanded that I should give so much care to them also. She was

constantly attending to the cleansing of her teeth, and I am quite well assured she never took food in her mouth without cleansing them after it. She was a wealthy woman, and liked to spend money on her teeth; the accumulated dental work in her mouth was simply remarkable, for it was the record of a continuous fight against the forces that produce caries. Yet all the things that all three of us had done, and could do, did not arrest caries in her mouth. I am free to admit that this was before the advent of the pumice and orange-wood stick prophylaxis propaganda. (Laughter.) It may not have been prophylaxis up to the modern standard, but it was such that if we could have everybody take such care of the teeth as that woman did, I think we would have a good opportunity to test out the value of the oral hygiene movement. But, notwithstanding our concerted efforts, the teeth of my patient persistently and continuously decayed.

**Do Filthy
Teeth Always
Decay?**

That is one type of case, and there are many others, and you have all seen them. On the other hand, there is the other extreme, and I have seen hundreds of them—I probably see more than you do, in the clinical service of the institution with which I am connected. I was called into the extraction room to see a man whose mouth was the filthiest pest-hole I ever looked into. I never saw a more repulsive mouth. The man was there to have a molar removed for some inflammation about it, but there was not a spot of caries in his mouth, and while he may have heard about cleaning the teeth—one cannot escape that—I am absolutely sure his mouth was virgin to a toothbrush. (Laughter.)

I ask you why it was that in the first case the woman's teeth continued to persistently decay and in the other case the man's teeth never decayed?

I deduce from these cases that caries is not *per se* a filth disorder, nor is caries of the teeth dependent upon the fermentation of adhering food particles. That is a view I must take of it in the face of the class of cases I have cited.

Do not misunderstand me. I contend that it is not essentially a filth disease in an obligatory sense, because we have filthy mouths in which the teeth do not decay, and because we have practically clean teeth where it does occur—not ideally clean, and I admit the difference, because there is a difference, but no mouth is ideally clean, and there is no practical means by which we can get a mouth ideally clean and maintain it in that condition. We may check the rate of decay, or rapidity of decay, but that is the utmost we can do in a susceptible mouth by any system of prophylaxis yet invented, depending for its efficiency on mouth sterilization or artificial mouth cleansing.

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The Undiscovered Factor in the Cause of Caries.

There is something else. Now, what is that something else? It is easy enough to ask the question, and when I attempt to answer that question I am not answering it, but hope I may be able to at least point out the direction in which we may intelligently seek for the wellspring of truth, for it seems to me that the grass is growing a little bit greener, and the formation of the country around this scientific question is so shaping itself that I can say with some degree of assurance, not that the spring is located in a particular spot, but that it is within certain limits, because the nearer we keep to certain lines the greener the country looks, and there are better indications of the waters of truth in that direction than in some of the others in which we have been traveling.

Scientific investigation of this subject has determined that the texture and the form of teeth have nothing whatever to do with their liability to decay. The studies of this subject, as made by Black and confirmed by others, have warranted him in making the enunciation which I have quoted from him. I think we may now say that we know that dental caries is dependent upon the environment of the tooth and not upon the structure of the tooth itself.

It may seem very much like carrying coals to Newcastle; it may seem very trite to reiterate a statement of that kind, but in justification of it I wish to read you a brief paragraph from a popular magazine. I quote from the *Dietetic and Hygienic Gazette*, of June, 1911, an article entitled, "The Lime Light of Our Diet," by James R. Mitchell, lecturer in chemistry at the Fort Worth Medical College at Fort Worth, Texas, who says:

"Our dentists prescribe tooth washes and tooth pastes, advocate local hygiene, fill cavities and fit bridges; and all this time ignore the fact that the basic cause is lime starvation. Dentists will tell you that the sugar you take in your mouth acts directly upon your teeth. Dentists shut their eyes to the evident fact that decay *starts first in the pulp* beneath the intact enamel and honeycombs the interior tooth until the shell-like bridge of enamel breaks beneath the strain. The enamel gives absolute protection against the external attacks of acids and sugar. I have immersed sound teeth for months in a solution of fruit acids and sugar, and have been unable to detect any erosion of either the enamel or the pulp."

Food Habits in Relation to Caries.

That is the dogmatic statement of a medical man who is a professor of chemistry in a medical teaching institution, and published in a popular magazine on dietetics for the instruction of the public.

Let us get back to the questionable features of our creed that clean teeth will not decay. I have been searching for some

other explanation for the cause of caries in susceptible mouths, where the teeth are kept as clean as practicable, and in that connection have been making a study for something over ten years of the food habits of individuals in relation to caries production. I have had the opportunity for examining the mouths of a great many school children, growing children, children in all walks and conditions of life, and wherever I have a case presented of what I call caries in a present active state, I examine it carefully with the dietetic factor in view. It must be remembered that susceptibility to caries is a state that comes and goes, like Bob Acres' valor.

We have a record of carious action always in a cavity, but because we have a cavity confronting us it is not proof positive that susceptibility to the carious process is at that time active. It may be a record of the past just as the crater is a record of former volcanic eruption. What we need to determine is whether caries is active when we are studying the question of caries in relation to food habit. I have found caries always to be connected with a certain type of saliva, and a certain type of salivary composition goes coincidentally with a certain type of food habit, and that type of food habit is invariably a type in which the carbo-hydrate food taken by the individual is such as to greatly overbalance the proteid side of the dietary. When you ask me what I mean by overbalancing it I am not able to tell you in specific terms, nor do I believe that anybody, in the present state of knowledge of the subject, can state accurately how much proteid should be combined with how much carbo-hydrate food, in order to make what would be called a proper diet for a growing child. That is one of the great problems of dietetics to-day. In the same magazine from which I have already quoted, there is a fine summary of the work that has been done in regard to dietetics of growing children, and it is noteworthy in the first place that the theorists disagree on that point, and it is, from my point of view, still more noteworthy that they fail to take into account the difference in the kind of carbo-hydrates used as food, and the difference in the kind of proteids; that is, they view the *quantity* of material, leaving out of consideration altogether the *quality* of food taken as the source from which the carbo-hydrates on the one hand and the proteids on the other are derived.

There is undoubtedly a theoretical norm at which we get the highest nutritional efficiency, but because we have as yet no exact formula for it, that does not invalidate my general statement that where we have to deal with a marked liability to caries, marked carious susceptibility, we are invariably dealing with an individual that is overeating on the carbo-hydrate side, particularly of starches. Then you may ask how does that square with my statement of a little while ago that the adherent food

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particles are not responsible for the carious process—why do you claim that this excessive carbo-hydrate diet is the cause of caries and yet claim also that the fermentation of the adherent carbo-hydrate food particles is not mainly responsible for it?

Light on that question came to me from my study of the salivary composition. In 1900 my attention was first called to this phase of the problem by listening to a paper read by Dr. J. P. Michaels, of Paris, in which he laid down the axiom that the salivary composition is a reflex of the food habit and the nutritional status of the individual, just as the urine is in some cases. So a study of the salivary composition in connection with the axiom of Black that the cause of caries is to be found in the environment of the tooth, began to throw some little light on this question. In the first place we always find caries taking place in an alkaline saliva, not in an acid saliva, and I wish to explain that by alkaline saliva in this connection I mean when it is alkaline to litmus, though it may be amphoteric, in which case there may be acid there, and it will still be alkaline to litmus paper. There must be enough alkali present to keep in solution the mucinous elements, in which case we have a condition necessary for carious development, provided the saliva contains also as a part of its composition, as it passes from the gland to the mouth, a soluble fermentable carbo-hydrate element. That soluble fermentable carbo-hydrate element is found in the saliva of caries susceptibles. Michaels described it as glycogen; I do not feel satisfied about it. It is not necessarily glycogen, to my point of view, but certain it is that there is some substance dissolved in the saliva of caries susceptibles, as the saliva issues from the glands, which is fermentable, and it is that which I verily believe is the normal food or pabulum on which the caries-producing organisms mainly thrive, and not mainly upon the adherent food particles attached to the teeth. Given a saliva containing a mucinous element in solution, and a soluble fermentable carbo-hydrate, and we have conditions favorable not only to fermentation by mouth bacteria, but also the conditions suitable for the localization of the carious action by the precipitation of this mucinous substance around the acid-producing organisms which immediately fastens them to the tooth.

Whether that particular mode of fixation of the bacteria is the process by which is formed a bacterial plaque that will be satisfactory to the Committee on Scientific Research of the New York Dental Society or not, I do not know. What I wish to point out, however, is that it is a demonstrable factor in plaque formation, and that it involves a principle which must be taken into consideration in explaining the mode of fixation of bacteria upon the tooth surface.

With such conditions, then, there is no difficulty in explaining both the localization and the fermentation processes.

And this brings us back to the question of salivary composition. As long as those conditions supervene, all our prophylactic means of mouth cleansing by pumice on a stick and toothbrushes and brushing, and by floss silk, merely reduce the rate of decay.

Has it come to pass in the economy of God Almighty that humanity, in order to live, to retain its dentures in a state of integrity, must make a never-ending fight with a toothbrush? Is there anything else we have to do in the struggle for existence that is at all comparable with this thing? Would it not be a very bungling piece of work on the part of Dame Nature for her to make it necessary that in order to survive to the extent of saving our teeth we must continue to depend upon these mechanical means? Immune individuals do not; why then should anyone?

There seems to be something wrong. We have all felt it, if we have not expressed it in that way; have we not been searching for an antiseptic agency in the saliva of the individual who is not susceptible? But consider for a moment, would it not be a somewhat anomalous proceeding on the part of Dame Nature to infect a mouth, as she does, with the bacteria of decay, and then protect that same individual from decay with some kind of antiseptic that the individual must liberate in some way to prevent the bacteria from destroying the teeth? But it is not an antiseptic that produces caries immunity, because the bacteria are still there and live, thrive and are active in the immune mouth. As Miller says, it is like asserting that grass will poison cattle, notwithstanding the fact that we all know they thrive particularly well in a good meadow. So the question of an antiseptic in the mouth of the immune individual is a contradiction of terms.

And where then does this lead us? I cannot abandon the thought that seems to be behind the question of salivary composition; the more we investigate it the nearer we seem to be getting to this wellspring of truth about caries. The composition of saliva is dependent, among other things, on what the individual eats, and how the individual metabolizes his food supply. We do not find as much caries in the mouth of the proteid-eater, as in the mouth of the starch-eater. If you will examine the advertisements of certain infant foods you will see pictures of fat and lusty looking babies about whom it says, "We are advertised by our loving friends,"—and "our loving friends" are always corpulent and fat babies. We all know, or ought to know, that when an individual consumes an unnecessary amount of carbo-hydrate food the result is the pro-

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duction of fat. The physiologist teaches us that this carbo-hydrate food material passes through the liver and comes out as glycogen, and if it is produced in excess of the nutritional needs for the time being, finally becomes stored in the areolar tissues and elsewhere as fat. At some period between the time when the excess carbo-hydrate food is taken into the stomach and its final storage in the tissues as fat, it passes through the glycogenic stage, and in that condition passes through the circulation, and the blood serum, loaded with this sugar-like material, passes through, among other things, the salivary glands, and a small portion of it, instead of passing on to be stored as fat in the tissues, is excreted into the mouth as a part of the salivary composition. It is that material which, in my judgment, furnishes the normal pabulum for the bacteria of decay in a caries susceptible.

**Growth of
Micro-organisms
Towards the Pulp.**

When we come to examine caries itself from a physical standpoint, under the microscope, if it be due to the fermentation of adhering food particles, how is it that down in the depths of the dentine, beyond the possibility of contact with adherent food particles, these bacteria penetrate; they penetrate pulpward always. Every biologist knows, and every bacteriologist knows, that the trend, the travel, the great migrations of the fauna of a country, are towards a food supply; the geographical distribution of animals has been determined by search for food. We find the same thing with bacterial colonies; as they grow they grow in the direction of their food supply, and according to the idea or theory that decay is due to fermenting food particles adherent to the tooth surface, they should grow toward the outside of the tooth; but on the contrary, they grow pulpward, and they find a food supply there or they would not continue to develop in that direction. It is a case of natural selection—they are obliged to go that way because they find their food in the body juices of the individual, in the protoplasmic strings in the dentinal tubuli in that direction, away from the adherent food particles.

**Caries Other Than
a Local Disease?**

This brings me to a point where I want to leave this thought with you, and that is, that the evidence, to my mind, is accumulating, and constantly accumulating, to indicate that decay of the teeth is a dietetic or constitutional disorder, the result of a constitutional state. It is active when the nutritional state of the individual is of such a character as to produce a kind and quality of oral secretion such as affords a normal food supply for a class of bacteria responsible for dental caries.

I am telling you only what I think and believe. I am not making assertions. But I want to establish that point of view in your minds toward this problem, and ask you to think in that direction.

If what I have said be true, then the prophylaxis of dental caries cannot be achieved solely with pumice on the end of a stick, nor with a toothbrush, but it is to be achieved from a dietetic point of view. It will be the problem of teaching people how to eat, not only how to chew, for that is but a phase of nutritional mechanism, but how much, and what, to eat, and what not to eat.

If you have any question in your mind regarding the abuse of dietetics, look up the statistics, write to the United States Government and get the statistics on the quantities of sugar, in the form of candies, consumed per capita by the embryo citizens of the United States. We have been so accustomed to take things that *are* as being right, that we have taken it for granted that it is all right for children to ruin their teeth, to ruin their health, to destroy their dentures by excessive candy-eating.

If what I am telling you is an approach to the truth, then the practical suggestion I have to make with reference to prophylaxis is, Study this question in a somewhat broader way, from a dietetic and physiological standpoint, and see if we cannot change the composition of the oral fluids, so that they will be a less favorable pabulum for the bacteria of tooth decay, and the individual will become immune.

I do not need to more than suggest to this association the fact which they well know, that the question of susceptibility to dental caries is a thing which varies at different times of life. We know that youth is the period of dental decay; we know that as the individual reaches later life the tendency to caries is less and less, although it may recur again. These changes I believe to be mainly due to variations in the food habit. Prophylaxis is, then, to be sought along dietetic lines, not merely by mechanical means; by the adaptation of internal relations to external relations, by making good health its own protection against disease, invasion of the teeth as well as of the whole body.

Rational Oral Hygiene—The Educational Phase.

By DR. ALBERT H. STEVENSON.

Chairman Committee on Public Health and Education, Second District Dental Society. Member Oral Hygiene Committee, New York State Society.

After decades of scientific progress in dealing with the many ills that man is heir to, there came a time when the grand old medical profession had to commune with a practical public. Bowing to the inevitable, some of the very best men in the profession, forsaking less arduous and more

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lucrative fields, devoted their energy and lives to the enlightenment of the people on sanitation and kindred measures of preventative medicine. To these men the medical profession owes much of its prestige of to-day.

The dental profession is now undergoing a like arraignment. The public has at hand certain facts regarding disease, and a general knowledge of its inception. This same public is fairly hungry for reasons as to why disease still destroys. It is distinctly an opportunity and a duty for this profession to show the vulnerability of an unclean mouth and the partial immunity from disease by reason of possession of a clean one.

Assuming that the forty thousand dentists in this country are doing this with the forty million patients they are credited with serving (Dr. Voelker in *ITEMS OF INTEREST*, April, 1912, page 301), how about the other fifty-two million? It is self-evident that the enlightenment of such a horde is beyond the pale of the dental fraternity; but if we initiate the movement, other institutions will continue it. Evidence of this will be found in the following communication received by the writer:

The International Committee of Young Men's Christian Associations.

April 4th, 1912.

DR. A. H. STEVENSON,
Brooklyn, N. Y.

DEAR SIR:—I am returning herewith your outlines of lectures. I hardly think either quite fits our situation, and what I want to ask you to do for our Health League is to work up a lecture that can be given to all classes on the care of the teeth, using from thirty to forty slides, as many of them colored as possible. In the lecture we simply want a brief description of each slide and a few sentences to connect them logically. We will, of course, pay the expense of the slides if you are willing to contribute this service. May I say that these slides will be sent all over North America, so that your message will be far-reaching. I will appreciate this service greatly.

Very truly yours,
(Signed)

GEO. J. FISHER,
Secretary.

An educational campaign in any large city is a herculean task fraught with great responsibility. With resourcefulness and tact, patience, and at times courage as necessary qualifications, there is no one man capable of conducting it. An earnest and efficient committee should be placed in charge. The public takes kindly to enlightenment only when shown specifically its application. The committee has this as a basis of operations.

The first step should be to consider existing institutions, and these should be utilized rather than antagonized. Right here is where many oral hygiene workers have erred. Interviews with the heads of the local departments of health and education, as well as influential members of the medical society, will save many weary hours of fruitless effort. Then,

too, the subject should be put in proper relation to other subjects that are being exploited at the same time. By this correlation, interest and support will be aroused in unexpected sources.

It can be readily understood that no one plan would do for all communities, but in the general scheme of things certain rules are universally applicable. A competent lecture staff should be organized from the volunteer members of the local dental society. It is not necessary that the men be experienced lecturers; simply good talkers. If this is understood there should be no difficulty in securing a strong staff.

By correspondence, all institutions, municipal and private, should be advised that the society is prepared to give practical talks on mouth hygiene. This information alone will bring in enough requests to start the staff at work. The principals of all schools, public and private; the secretaries of all branches of the Y. M. C. A. and Y. W. C. A.; the head-workers of settlement houses; the superintendents of training schools for nurses; the secretary of the local medical society; all should be duly notified that the campaign is in progress.

**Lecturers
Trained to
Lecture.**

As the requests for lecturers come in, the men should be assigned with judgment. Many an inexperienced man who would hesitate to address a large public meeting, would very creditably fill an assignment to give a talk before a group of Y. M. C. A. athletes or mothers at a parents' meeting. As a man gains experience and confidence he can be given more difficult audiences. In this manner lecturers are developed.

It is manifestly impossible to give a convincing lecture if the speaker reads from manuscript. On the other hand, it is very necessary that the men should talk along definite and uniform lines. To obviate this difficulty a lecture outline form should be supplied to each speaker. As a lecture before a body of trained nurses should differ materially from a talk before an assembly of children, it is necessary that the forms should vary, and be suitable to each type of audience. In many cases the speaker is restricted as to time allowed. The form will keep him to the subject, and within the time limit.

The Second District Dental Society of New York, with almost two hundred of these lectures to its credit, has a most complete set of these outline forms, which are appended. The lantern slides of this society have been duplicated by request and forwarded to many parts of this country and Canada, as well as New Zealand and South Africa.

As the public receives its news so will it receive its instruction. The habit formed of learning of current events by headlines and pictures can be turned to advantage in the oral hygiene work. Illustrations by stere-

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opticon are valuable accessories. The illustrations must be clear and the matter not too complex. A few slides showing the development of the teeth, and a series depicting the progress of caries in a denture from the perfect to the extreme are always well received. The points difficult of access can be shown for consideration in applying the hygiene. The Tufts College chart, showing the effect of uncleanness, is another excellent slide.

Where the lantern cannot be used (as is usually the case), large legible charts are utilized. Some men use the blackboard most effectively, and give an entertaining and convincing talk, using this means of making their points clear.

If an institution is very large, and it is necessary to give a number of talks, it is advisable to give them consecutively. In the Y. M. C. A. work in Brooklyn this plan is followed, and after the last lecture a synopsis appears in the branch periodical. The same routine is followed at each of the branches. In this way many thousands are reached. A sample synopsis reads as follows:

Mouth Hygiene.

I take it for granted that all want to live to a good old age.

There are men throughout this country who are trying to prolong life—your life—by *preventing disease*.

It is a significant fact that there were but sixty-one persons who died last year to every one hundred who died in 1878, thirty-five years ago, a saving of 44,115 lives in this city alone.

To do real damage, disease must enter the body. How do most of the contagious diseases find their way into the system? Through the door-way—the mouth.

It is common knowledge that disease germs can neither thrive nor survive unless unclean conditions exist. How is it in your mouth?

There are three things necessary to sustain life—food, water and air. All of the food, all of the water and part of the air enter the body through the mouth. Hence, the importance of absolute cleanliness at all times.

The most stringent Pure Food Law is useless unless the mouth is clean, as the law does not control the food after it has passed the lips. If allowed to remain in the mouth, food becomes polluted worse than any form of adulteration.

Wherein lies the remedy? In practical mouth hygiene.

Hygiene.

Clean the mouth oftener and clean it better.

Brush the teeth whenever they are unclean, after every meal, if possible; at least, after breakfast and the last thing at night.

The brush should not be too large, and should be slightly curved, as is the arrangement of the teeth. Medium stiff bristles will be found best for most people.

Dentifrice (powder or paste) should not be too gritty.
 Dental floss should be carefully used for interspaces.
 Remember to brush away from the gums, and that there are inner as well as outer surfaces.

Masticate thoroughly for, like the muscles, the teeth improve with use.
 These rules of mouth hygiene, although simple, are effective. Make them a habit and increase your immunity to disease.

**Oral Hygiene
 Teaching in
 Schools.**

Oral hygiene in the public schools has been most woefully ignored by the pedagogues. A review of the syllabi and study outlines of the educational systems of several large cities fails to disclose aught but meagre and antiquated consideration of this subject.

In the text-books on physiology and hygiene, there is scant reference to the teeth as to number and function, and advice to use a toothbrush; but that is all. The entire subject of physiology in the New York City schools, for instance, is covered in twenty periods—one period each week of the term. There is no time for a proper consideration of the mouth, even should the teacher desire it. Efforts have been made to have dental lecturers give talks to the children, with varying success. To our discredit it must be admitted that the most effective work of this kind now being conducted is under the auspices of the manufacturers of a popular dentifrice. In New York City the authorities have been persuaded to issue a pamphlet on mouth hygiene, and distribute the same to the children.

"Most of the children showed a more or less complete lack of dental hygiene, their mouths in many instances filthy to a degree unbelievable. There should be some means of educating the people as to the importance of dental treatment, and value of preventative rather than reparative dentistry." So reads the last report of the Health Department of the largest city in this country.

This is a challenge to the dental profession. How shall we answer it? As can be seen, the educational phase of the oral hygiene is a most complex proposition. While much has been accomplished through questionable channels, this should be no deterrent to the conscientious worker. Nor does it give the critics license to condemn the movement as a whole. History repeats itself, and in the distant future a just and discriminating public will honor those who, by earnestly exploiting oral hygiene, have aligned themselves under the banner of Preventative Medicine.

The lecture outline forms follow:

FORM I.

Lecture Outline for Mothers' Clubs.

The following points seem to be the ones that need the most emphasis:

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1. Show that the responsibility for the general health of the child depends mainly upon the mother, and that she should have sound ideas of how to conserve the child's health.
2. Bring out the influence that sound, clean teeth have upon the general health of the child.
 - a. Show how diseased and unclean teeth play a large part in the causation of disease. That the method of infection in the following diseases is the discharges of the mouth: Tuberculosis, pneumonia, influenza, la grippe, diphtheria, measles, scarlet fever, mumps, etc.
 - b. Show how lack of, or decay of the teeth cause mal-nutrition, mouth-breathing, adenoids.
 - c. Show how the pain of diseased teeth may be reflected and cause infection in the eyes, ears, face, neck, head, and other parts of the body.
3. Show how the temporary teeth develop and then the permanent ones.
(Use Charts.)
4. Show the importance of preserving both.
Lay particular emphasis upon the sixth-year molar.
5. Function.—Tell how the teeth improve with use and advantage of thorough mastication.
6. Conclude with general mouth hygiene, as follows:
Articles Required:
Brush—Size and shape.
Floss—How to use.
Dentifrice—Warning and advice.
Method of brushing.
Time: Every time the teeth are unclean.
Tell something about the removal of tartar.

FORM 2.

Outline of Twenty-five Minute Talk to Children.

1. (For boys.) Show how success in sports and life depend upon good health.
(For girls.) Show how success in singing, reciting, or any public appearance depends upon good health.
Show that good health is impossible without clean mouths and good teeth.
2. Explain the relation of sound, clean, temporary teeth to health.
Explain the relation of sound, clean, permanent teeth to strength, endurance, grace, beauty, and class-standing.

3. State briefly how decay is produced and how it extends, using illustrations, if possible.
4. Emphasize the importance of preserving the temporary teeth, and the sixth-year molar.
Introduce phrase, "A clean tooth never decays."
Have children repeat it in unison.
5. Explain the dangers of bolting food, and the advantages to the teeth and body in general, of thorough mastication.
6. Conclude with general mouth hygiene, as follows:
Articles Required:
Brush—Size and shape, bristles.
Floss—How to use.
Dentifrice—Warning and advice.
Method of brushing.
Time: Every time the teeth are unclean.

FORM 3.

Lecture Outline for Nurses and Physicians.

Preface with remarks showing the sphere of preventative medicine, and as a part of same the importance of the oral hygiene crusade, indicating its scope value and application. Emphasize the necessity of the co-operation of the nurses (and physicians) to bring about its aim.

The following points seem to be the ones that need the most emphasis:

1. Show how unclean mouths are ideal mediums for the proliferation of bacteria. Indicate the following as diseases whose main means of infection is the discharges of the mouth: Tuberculosis, pneumonia, influenza, la grippe, diphtheria, measles, mumps, etc. (Quote authorities as per Form 3a.)
Show how lack of, or impairment of, the teeth cause mal-nutrition, mouth-breathing, adenoids.
2. Give brief histology and development of the teeth, temporary and permanent, showing how calcification proceeds and dietetic influences.
(Use Charts.)
Discourage the use of glass tubes for administering drugs, and advise capsule or tablet form for all administrations of tinc. of ferric chloride. Emphasize that dilution increases destructive strength of this drug on the tooth structure.
3. Show prevalence and nature of dental caries as a disease itself, and conditions favorable for its inception and increase. Show how reflexly disorders of the eye, ear and brain may result.



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4. Give general mouth hygiene for normal conditions indicating:
Articles Required:
Brush—Size, shape and bristles.
Floss—How to use.
Dentifrice—Warning and advice.
Method of brushing.
Time: Every time the teeth are unclean.
Mention the formation and removal of tartar.
5. Give the application of the hygiene by nurses, emphasizing:
 - (a) The preparation of patients for operations.
 - (b) The care of the mouths during pregnancy.
 - (c) The care of the mouths of children.
 - (d) The care of the mouths of invalids and convalescents.
6. Conclude with the importance of strict oral cleanliness on the part of the nurses as a safeguard against infection for themselves, and those for whom they care.

FORM 3A.

Lecture Outline for Nurses and Physicians.

Notes.

"From a hygienic standpoint, the secretions of the mouth constitute the chief, if not the only, source of respiratory infection."—*Dr. Wadsworth of the Medical Commission for the Investigation of Acute Respiratory Diseases, N. Y. Dept. Health.*

"By careful attention to the cleansing of the mouth, and the sterilization of food, the alimentary tract may be rendered comparatively sterile."—*Harvey Cushing, John Hopkins University.*

"Each patient should be furnished with a new toothbrush, and a bottle of antiseptic mouthwash, and the nurse instructed to cleanse the mouth every two or three hours prior to a surgical operation."—*Moynahan.*

"Three patients (two men, one woman) died from tuberculosis. In each of these three cases the contributing cause was a decayed or impacted third molar tooth."—*M. Dubois, Chief of Clinics at the Ecole Odonto-Technique, Paris, France. From "Revue Generale de l'Art Dentaire."*

"Severe case of tonsillar inflammation is caused by the focus of infection in the mucous membrane near a decayed third molar tooth. Also persistent throat inflammation and tonsilitis is caused by the infection from decayed or diseased teeth."—*F. LeMaire, Paris, France, in the "L'Odontologue."*

"Many cases of chronic lacuna tonsilitis have arisen from, and are

continued by, if not originated by diseased conditions of the teeth and gums."—By Wyatt Wingrave, M.D., Durham, Eng., in *"The London Lancet."*

"Measles, German measles, chickenpox, whooping-cough, mumps, scarlet fever, or scarletina, diphtheria, influenza, smallpox, all have for their method of infection, either the discharges of the mouth, nose or particles of the skin, and the most fertile soil, the most prolific breeding ground, and the best harbor and the never failing spring for the germs of all these diseases, are filthy and decayed teeth."—A. Brown Ritchie, Medical Officer to the Education Committee of the city of Manchester, Eng., in *"Allen's Civics and Health."*

"Out of 684 sarcomas in different regions of the body, 309 of these were on either the lower lip, upper lip, tongue, mucous membrane, of the soft and hard palate. One very frequent cause of these malignant tumors is the constant irritation of a sharp edge of a decayed tooth."—Woods Hutchinson, A.M., M.D.

FORM 4.

Outline of Short Talk to Kindergarten Children.

Open talk with either story or demonstration to attract attention, and then proceed with the following:

1. Describe graphically the doorway and vestibule of a house, and the effect on the interior of that house, be it ever so neat and clean, of a dirty entrance with children passing in.
2. Show the analogy of the mouth as the doorway and vestibule of the body, and the effect on the interior of the body of an unclean mouth with food passing through and carrying filth into the stomach,

Results: Disease and illness; loss of play and school.

3. Ask how many children washed their faces before coming to school. (Usually unanimous.) Then show the importance of cleaning the "inside of the face," in order to be clean and well.
4. Very briefly, with a large model, if possible, show the alignment of the teeth. Tell the necessity of keeping them clean to prevent "holes" and pain.
5. Conclude with simple mouth hygiene, demonstrating with giant tooth-brush on model, and emphasize the frequency of this operation and the use of a dentifrice.



A Home for Indigent Dentists.

In our March issue we published a communication from the Committee appointed by the National Dental Association to establish a fund for the aged and indigent of our profession. In the same issue there appeared an appeal from Dr. J. E. Story, of Texas, in which he suggests "a beautiful home on the outskirts of some centrally located little city, which would be maintained by contributions donated by members of the different dental societies." At Birmingham, Ala., March, 1909, Dr. Jas. McManus read a paper before the National Dental Association entitled "*A Side Light on Professional Interest*" (*Dental Cosmos*, July, 1909) in which he described the British Dental Benevolent Association and the advantages accruing to its members.

There is no doubt that it would be a wise and a worthy achievement to organize our profession in some way that would assure a place of rest for our worthy but indigent old men, of whom, unfortunately, there have been all too many in the past, as there will undoubtedly be in the future.

The suggestion advanced by the Committee that each member of every State Society should pay one dollar per annum into such a fund is a good one if it could be carried out. The Committee tells us that the plan has been adopted by the Kentucky and Tennessee Societies, and that other Southern States have agreed to do so if the National Association



approves the plan. If the writer is not mistaken, the New Jersey State Dental Society was the first to increase its dues one dollar per year, this additional dollar to be set aside for the assisting of those in need.

Difficulties. Assuredly one dollar per annum from each member of all our State Societies would yield a

goodly sum, one that in time might enable us to realize Dr. Story's ideal proposition. But the addition of even one dollar per annum to State Society dues is not so easily accomplished just at this time. One might say the psychological moment for the urging of this plan has not quite arrived. We are in the throes of reorganization throughout the country. National, state and local societies are all at work on the problem, and this question of additional dues is a factor, one might almost say a stumbling block, everywhere. State Societies are asking local societies to increase their dues one or two dollars per annum and join the State Society in a body. The National Association is asking the State Societies to add two dollars to their membership dues and bring their men into the enlarged National. In some sections dentists are being asked to approve of legislation which will compel them to re-register annually and pay a fee of one dollar, thus creating a fund with which to prosecute illegal practitioners. In other sections we hear of adding one dollar annually to society dues, the members so subscribing to be protected in the courts against the machinations of black-mailers who bring malpractice suits.

Many other worthy objects are heard of which might be supported with one dollar per year from society members. But just at this time the most important project of all is the reorganization of local, state and National associations into one grand brotherhood of American dentistry. Grant but a few years for the accomplishment of this, and it will be easy enough to take care of our indigent old men, yea, to give them a beautiful home in their declining days, with trailing arbutus to afford them shade and the aroma of sweet flowers to scent the air.

**Plan for
Collecting
Funds.**

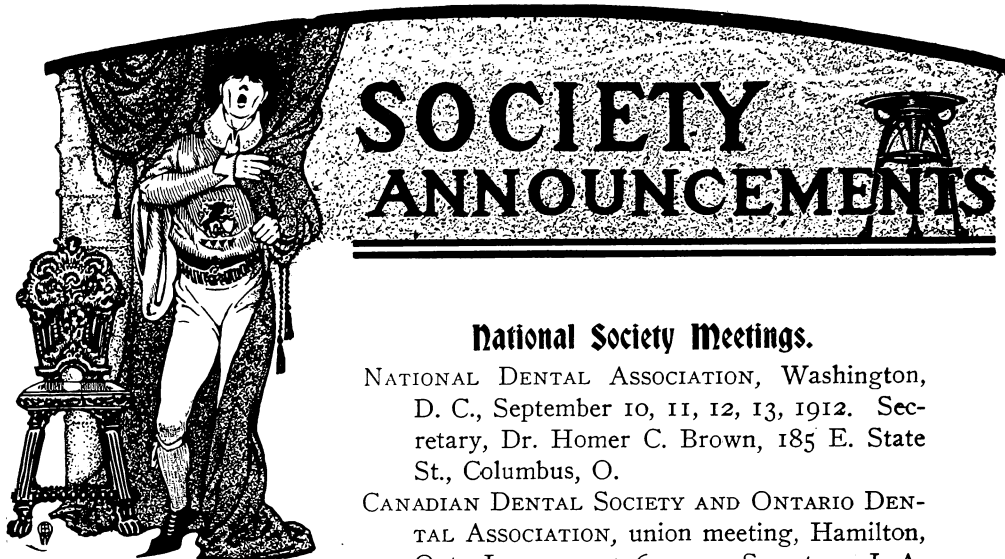
There is a plan, however, which might be put into effect immediately. The Red Cross Society receives tremendous sums of money annually through the sale of its Christmas seals. Thousands of dollars have been contributed by dentists to this very fund.



ITEMS OF INTEREST

Why not adopt a similar plan for the benefit of our own brethren? The National Association Committee might distribute Christmas seals, which could be placed on sale in every dental depot in the country. Packages of the seals could be sent about November 1st to every dental society in the United States. Thus, through the agency of the dental depots and the dental societies, we would reach all in the profession, whether society members or not. If it were understood that the proceeds would be devoted to the worthy old men and the infirm of our profession, the sales ought to be large. Why not give this plan a trial?





National Society Meetings.

NATIONAL DENTAL ASSOCIATION, Washington, D. C., September 10, 11, 12, 13, 1912. Secretary, Dr. Homer C. Brown, 185 E. State St., Columbus, O.

CANADIAN DENTAL SOCIETY AND ONTARIO DENTAL ASSOCIATION, union meeting, Hamilton, Ont., June 3, 4, 5, 6, 1912. Secretary, J. A.

State Society Meetings.

ARKANSAS STATE DENTAL ASSOCIATION, Little Rock, Ark.

Secretary, Dr. I. M. Sternberg, Fort Smith, Ark.

ARIZONA DENTAL SOCIETY.

Secretary, Dr. H. H. Wilson, Phoenix, Ariz.

NORTH CAROLINA DENTAL SOCIETY, Raleigh, N. C., July 3, 4, 5, 6, 1912.

Secretary, J. W. Stanly, Wilmington, N. C.

VIRGINIA STATE DENTAL ASSOCIATION, Old Point Comfort, Va., July 9, 10, 11, 1912.

Secretary, Dr. W. H. Pearson, Hampton, Va.

WEST VIRGINIA STATE DENTAL SOCIETY, Webster Springs, Va., Aug. 14, 1912.

Secretary, Dr. Frank L. Wright, Wheeling, W. Va.

WISCONSIN STATE DENTAL SOCIETY, Oshkosh, Wis., July 9, 10, 11, 1912.

Secretary, Dr. O. G. Krause, Wells Bldg., Milwaukee, Wis.

Federation Dentaire Internationale.

The section of Bibliography and Documentation of the Fédération Dentaire Internationale (F. D. I.) is established, 3 bis, rue de la Régence, Brussels, Belgium (Palais des Beaux-Arts), and all invoices of books, newspapers, pamphlets, catalogues, engravings, photographs relative to the dental art should be sent to the above address.



National Association of Dental Faculties.

The National Association of Dental Faculties will meet at the New Willard Hotel, Washington, D. C., on Friday and Saturday, September 6th and 7th. The Executive Committee will meet at nine o'clock Friday morning, the general meeting opening at ten o'clock the same morning.

GEORGE EDWIN HUNT, Secretary.

Indianapolis, Ind.

National Dental Association.

Communication from the Local Committee of Arrangements. Washington Admirably Adapted for a Convention City.

The needs of organization incident to conventions are good passenger transportation facilities, hotel facilities, convenient places in which to hold sessions, good publicity facilities and, not unimportant, pleasant surroundings.

Washington supplies all of these requisites and offers much more. A city that can easily handle the enormous crowds of visitors that throng the streets every four years at the inauguration of the President of the United States, is patently equipped to care for, both in railroad and hotel accommodations, any special gathering at other times. Washington hotel men have become accustomed to quick expansion and contraction of business. The coming and departure of Congress, with the thousands dependent upon its sessions and the large number of conventions which have been coming to the city in recent years, have served to make irregularity in numbers at depots and hotels the regular thing. Two conventions of considerable proportions were recently held in a single hotel, with no confusion in session halls, banquets or accommodations.

As to the publicity facilities, there is no greater news distributing center in the United States. Correspondents representing not only all of the daily newspapers of the country, and many of the foreign journals, have their offices in Washington, but even the technical and trade publications have their contributors and regular correspondents at the capital.

Places of Interest.

In pleasant surroundings for the visiting delegate and his wife or daughter, who often accompany him, Washington far excels any other city of the country. It is the custom for delegates to conventions here to use much of their time seeing the hundreds of interesting and beautiful places in and about the city by means of the "Touring Washington" automobiles upon which guides point out, as the trip proceeds, the places of especial historical interest. Then there are many side-trips. Mt. Vernon,



SOCIETY ANNOUNCEMENTS

the home of Washington, is reached both by steamer and trolley; Alexandria, Cabin John Bridge, Arlington and old Annapolis, the site of the United States Naval Academy, are easily accessible by trolley cars. To the last place and to Baltimore there is a new line of heavy interurban electric cars, which travel so fast that the trip to either place is made in shorter time than by the steam roads. Washington itself, the city beautiful, is a constant delight to the visitor, and the government departments hold thousands of features of interest to every American, and many features of special interest to delegates to conventions.

JOHN H. LONDON,
Chairman of Local Committee of Arrangements.

Hotels.

Below is a list of the principal hotels and their rates:

The headquarters of the National Dental Association and also the National Association of Dental Faculties is the new Willard Hotel.

Meetings and clinics will be held in the large ballroom on the eleventh floor.

Write the hotel and make your reservations early.

- S. Single without bath.
- D. Double without bath.
- S. B. Single with bath.
- D. B. Double with bath.

The New Willard—Penna. Ave., 14th & F Sts., N. W.

- S. \$2.50 per day and up. S. B. \$3.50 per day and up.
- D. \$4.00 per day and up. D. B. \$5.00 per day and up.

The Raleigh—Penna. Ave. and 12th St., N. W.

- S. \$2.00 per day and up. S. B. \$3.00 per day and up.
- D. \$3.00 per day and up. S. D. \$4.00 per day and up.

Shoreham—15th and H Sts., N. W.

- S. \$2.00 per day and up. S. B. \$3.00 per day and up.
- D. \$3.00 per day and up. D. B. \$5.00 per day and up.

The Ebbitt House—14th and F Sts., N. W.

- S. \$1.50 per day and up. S. B. \$2.50 per day and up.
- D. \$2.00 per day and up. D. B. \$3.50 per day and up.

Hotel Gordon—16th and I Sts., N. W.

AMERICAN AND EUROPEAN

American plan \$3.00 to \$4.50 per day.

European plan \$1.50 to \$2.50 per day.

Normandie Hotel—15th and I Sts., N. W.

ITEMS OF INTEREST

EUROPEAN

S. \$1.50 and \$2.00 S. B. \$2.50 to \$3.50
 D. \$3.00 to \$4.00 D. B. \$4.00 to \$6.00
 New Fredonia Hotel—H St., bet. 13th & 14th Sts., N. W.

AMERICAN AND EUROPEAN

American plan \$3.00 per day and up.
 European plan \$1.50 per day and up.
 The Cochran Hotel—14th and H Sts., N. W.

AMERICAN AND EUROPEAN

American plan \$3.00 per day and up.
 European plan \$1.50 per day and up.
 The Hamilton Hotel—14th and K Sts., N. W.

AMERICAN PLAN

\$2.50 per day and up.
 The Dewey Hotel.

AMERICAN AND EUROPEAN

American plan \$2.50 per day and up.
 European plan \$1.50 per day and up.
 The National Hotel—6th St. and Penna. Ave., N. W.

AMERICAN AND EUROPEAN

American plan \$2.50 per day and up.
 European plan \$1.00 per day and up.
 Metropolitan Hotel—6th St. and Penna. Ave., N. W.

AMERICAN AND EUROPEAN.

American plan \$2 50 per day and up.
 European plan \$1.00 per day and up.
 St. James Hotel.

European plan \$1.00 per day and up.
 The Grand Hotel—15th St. and Penna. Ave., N. W.

AMERICAN AND EUROPEAN

American plan \$2.00 per day and up.
 European plan \$1.00 per day and up.